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REMARKS ON MR. RHETT'S ADDRESS, AND MR. ELLIOTT'S EXAMINATION OF IT:

BY WILLIAM WRAGG SMITH.

[Continued from page 403.]

EQUALITY OF PRODUCTION.

No. 1.—"*Who is the Producer?*"—An Address delivered before the Beaufort Agricultural Society, by Edmund Rhett, Esq., August, 1840.

No. 2.—Examination of Mr. Edmund Rhett's Agricultural Address, by Wm. Elliott, Esq.

But Dr. Smith tells us that such labor is not productive—has no material value, because *it does not fix or realize itself in any permanent subject, or vendible commodity which endures after that labor is past, and for which an equal quantity of labor could afterwards be procured; because it perishes in the very instant of its production.**

A bushel of corn purchases a day's labor—this is its value; but is not this value consumed the instant the equivalent is paid? The bushel of corn endured, it is true, after the labor which produced it was accomplished; but the moment its value has been brought into exchange it is consumed—partly as food, partly exchanged for other necessaries. The services of the menial, or the talents of the player, do not perish in the instant of their *production*, but only, as the bushel of corn, in the instant of their exchange or *consumption*. The production is in the acquirement or natural facility of these vocations. The *capacity* to serve, or to amuse is the product; and the servant might reserve his services, or the player his exhibitions until he chooses to exchange them for a suitable compensation—then, and then only it may be said these products are consumed. How can the labor bestowed upon the land be said to endure—to fix itself in a permanent subject, for which an equal quantity of labor could afterwards be procured? The product of this labor may be sold, it is true, and yet remain unconsumed, to set in motion other labor; but if not immediately consumed, it eventually is. It only changes hands in the mean time. It was originated to be consumed.

The immaterial commodity of the lawyer, player, or author, has at least as long a life; indeed that of the latter may be said

* Wealth of Nations, vol. ii., b. ii., ch. iii., p. 3.

to be immortal. An opera ticket may be purchased and transferred until the last holder consumes its value. A lawyer's opinion may be paid for, and an attorney afterwards sell the article with a profit; and literary property under copy-right may not only continue for an indefinite period its *material* value; but may be realized as a vendible commodity, which will put in motion a much greater quantity of labor, sometimes, than that which originally produced it.

Some manufactured commodities are more durable than others. Their full value may be enjoyed in use and they may be resold.—This is the case likewise with professional or immaterial commodities. The advice of a physician is bought in a single case; but the knowledge once obtained, it can be used afterwards in other similar cases. So, having had the reading of a book we may dispose of it.

"But," says Adam Smith, speaking of the unprofitable servants of the commonwealth, "The protection, security, and defence of the commonwealth, the effect of their labor this year, will not purchase its protection, security, and defence for the year to come."

Because these services are in their nature perishable—are consumed in their performance, just the same as the food and the clothing given in consideration for labor are consumed—they would not maintain or clothe the laborer for the ensuing year.

The followers of Adam Smith, driven from all these positions, may still rally, however, on their old vantage ground, as they suppose, and repeat the argument as it was used formerly against them by the Economists, putting the old test with which Dr. Smith opens his chapter—"That labor is productive which adds to the value of the subject upon which it is bestowed. Thus the labor of a manufacturer adds, generally, to the value of the materials which he works upon, that of his own maintenance, and of his master's profits. The labor of a menial servant, on the contrary, adds to the value of nothing."

There are some manufacturers who do no more than add to the value of the materials they work on, their simple maintenance.—The shoe-maker, who makes with his own hands a pair of shoes, does this and no more. Where is the difference between him and the menial? The latter's raw material is not so evident to the senses as the former's; but we would not be wrong were we to say that his raw material is his body and understanding; he converts to some useful purpose the capacities of his hands, legs, and sense. Can he be said to add to the value of nothing? Are not these faculties capable of improvement?

Let us ascend the scale of employments. We have sufficiently shewn in the former part of our subject that the difference formerly contended for between the agriculturist and the manufacturer and merchant, was altogether imaginary, arising from partial

views of the distribution of profits. As the scale and profits of any business become extended, it admits of the same principle of distribution as agriculture, or (which has since been equally allowed,) as manufactures. And there is not the slightest reason for refusing to other employments the same constituents of productiveness.—The Author originates a value. The gross sale of this value is sufficient to remunerate the maintenance of stationers, printers, and book sellers, and give to each of these classes a certain profit, besides a nett income to the author. The profits of a lawyer in good business are expected to yield him a surplus more or less, after paying the salaries of clerks, office rent, interest upon capital expended in acquiring legal knowledge, &c. And where is the difference between capital expended upon the land or manufactures, and that expended upon the acquirement of professional knowledge, or those accomplishments from which a profit is made, and by which maintenance is given to other classes connected with these professions or arts? Any business systematically conducted —whose operations are extensive, has its distinct divisions and subdivisions of employment—maintains several classes. It is simply *division of labor* and no more, which assigns rent to the landlord, profits to the farmer, and wages to the laborer.

Mr. Elliott agrees with Mr. Rhett in his definition of wealth as —an "accumulation of exchangeable values." He acknowledges that men of scientific and professional pursuits are *instrumentally* productive laborers; but he founds the strength of his argument upon a distinction between *accumulation* and *production*.

Mr. Rhett puts the question—"Does it not follow that he who by his labor, be it never so immaterial, has accumulated that wealth, or originated the equivalent for which that wealth is substituted, and which that wealth represents—is a producer?" To which Mr. Elliott answers: "No! It would be but a confounding of terms to call him a producer. He is an *accumulator*. He gathers wealth for himself not for the State. He transfers to himself a portion of the pre-existent wealth, and the sum of material, tangible, taxable wealth in the society, remain precisely as it was before." *

How is it possible that it remains the same as before? Or that "there is as much wealth in the State without these classes as with them?" †

If, (what Mr. Elliott grants) "the lawyer, by establishing a certain title to land that was before in dispute, may give a character of permanency to the improvements, and authorize the outlay of capital, which will increase its value. The doctor, by healing the diseases of the farmer, may restore his strength, and fit him for the labors of agriculture. The parson, by inculcating the sublime precepts of

* Examination (Southern Agriculturist, March,) page 118.
† Ibid, page 116.

the christian morality, may allay the violence of the passions, confirm the reign of law and order, and thus augment the value of all property," &c.,* are they not accumulators of the wealth of the State, as well as their own? Do they not add to the value of the equivalent received, which makes their own wealth, the increased product of those values spoken of, which, without their existence or productive labor would have been diminished? Had the farmer continued uncured, his land must have lain idle. Had the man of science not made his discovery, millions would have been lost to the State. Mr. Elliott supposes, however, that these benefits are merged in the "equivalents"—in the *price* which has been paid for them—that no new value has been raised up by them in the community. Who would employ these services if they considered that they were to be made poor precisely in proportion as the persons rendering them became rich? Do they not, on the contrary, expect a gain? What proportion does the "equivalent" of forty dollars for surgical attendance on a prime hand bear to the immense difference between that prime hand and a cripple for life? Does not that sum, once paid, secure the annual re-production afterwards of the value of prime labor? How can we loose sight of the plain fact, that, without these *unproductive classes*, as they are called, production would be sensibly impaired?

Without a servant, how much precious time would not the lawyer have to lose, in administering to his daily wants himself! How much of his income would he not sacrifice. The time lost would be perhaps worth to him at the rate of two dollars per diem. How much longer would he not be in farthering the decision of that title, the dispute to which has kept so much land lying idle Yet, the servant, for the pitiful "equivalent" of ten or fifteen dollars per month, is an actual producer to the lawyer to the extent of five times that amount, and enables him, in his turn, besides, to produce to some one else a crop, which, for some time, without his assistance, would not have been grown.

Yes—but he is not *directly* a producer—is replied. To which we return—all then that we have to say is, that neither is the laborer who tills the ground a producer directly, because he simply *accumulates* for himself so much food, &c., and only *enables* the farmer to make that profit upon his stock, which he could not have made without him. Nor are the planter and the master manufacturer direct producers, because they only act instrumentally, or employ the agency of others to increase the matter that is in hand. By the instrumentality of their skill, the capital and labor of the country effects such an addition to the value of the raw material as produces a revenue. Without this skill, for which, like the lawyer or physician they are compensated by their profits, capital and labor could

* Examination (Southern Agriculturist, March,) page 116.

effect little or nothing upon the raw material. Were it not for this skill, the planter or manufacturer would either save nothing—produce nothing; or if they did, their gains would be so much taken from the gains of labor and capital. In other words, they might make profits; but the wages of labor would be ill paid, and the market rate of capital low. There would be no national gain.

In proportion as less skill is brought to bear generally upon the land and labor of the country, the income generally of the country is diminished; every addition of skill augments it. But we affirm that statesmen, men of science, judges, lawyers, teachers, clergymen, doctors, are actually concerned in the direct application of skill and labor to the land and labor of the country as well as the planter, and that their profits are not *accumulations* for themselves —transfers merely of the pre-existent wealth of others; but *the savings out of these increased products, increased by them—nett values which exist without any diminution, but on the contrary, with augmentations of the revenue of the land and labor of the country.*

How is it that, without subtracting from the revenue of any class, the profits of the manufacturer are increased—a greater quantity of commodities exported, and so much besides added to the income of all persons who consume such commodities, in consequence of their cheapness? By the inventions of science.

Because the labors of some branches of science may have no immediate visible effects, and an effective price of machinery, or a useful art may be the distant result of the compounded efforts of science, which, after a period of years, is developed in the fruits of increased production, the pursuits of men of science are not recognized as directly productive. But it would be difficult to prove how the planter is a direct producer, if these several partial efforts are not allowed to have a *direct* action in producing the ultimate whole beneficial result—if all men of science are not to be ranked as direct producers. For planters, like men of science, differ in the degrees in which they produce. Yet, though some may, in fact, produce nothing, the appellation of producers is applied generally. And, during the years that a planter devotes himself to the acquirement of experience and skill, it ought to follow that he is only indirectly a producer; and he ought to be called a *direct* producer *then* only, when he shall have realized the full result of his skill and experience.

If the discoverer of a principle in science, or the inventor of a partial machine, upon which, fifty or a hundred years afterwards, some valuable improvement is founded, is no direct producer, our ancestors, who formerly were content with thirty bushels of rice to the acre, and with hand grindstones and pestles, were not direct producers.

These various classes, by their labors increase the wealth of a community in the same way as proprietors, cultivators, and labor-

ers, artificers, manufacturers, and merchants, upon the same principle—division of labor. There is demand for them precisely as there is demand for corporeal labor, for the natural powers of the land, for the skill and capital which improves it, for the management which the cultivator exercises, who gives the proper equivalent for these different uses, and for the artificer, for the skill of the manufacturer and machinist, for the enterprise of the merchant, for masters of navigation and seamen. Unless we deny that legislators, men of science, lawyers, factors, &c., assist *instrumentally* the products of the land and labor of the country, we cannot refuse to put them upon the same footing with the productive classes who are in fact only instrumentally producers—parts in the division of labor, aiding the whole. By a greater quantity of exertion the services of some of these classes may be dispensed with, perhaps; but if this were generally the case, they would no longer exist, and we should not then be called upon to prove their title. By similar exertions, by inventions of machinery, corporeal labor is dispensed with; yet we do not cease to call such labor productive.

It is plain that we are not justified in calling these classes unproductive, because in some instances they may actually fail to produce any thing. Sovereigns, magistrates, and legislators, who are maintained by exorbitant taxes, without the country deriving from them any profit or benefit, commensurate with the price of their maintenance, would be unproductive; but this is the fault of the nation which uses such bad economy. In general, the services of these classes are expected to replace the taxes they consume with a large re production of wealth and happiness to the nation. An author, while he writes none but bad books, and has no other means of support but the scanty earnings of his mis-directed labor, may not be a producer of profits to himself, though printers and stationers might profit at his expense. He is on the same footing with the farmer who tills an unfruitful soil, who sets in motion labor, but makes no profits. Bad farmers may be as common as bad authors who are such professionally. But literary labor may be not at all productive at one period, and very much so at another. Fortunes have been realized by the sale of works, for whose copy-right in their day a purchaser could not be found; and the ultimate effects of literature and the arts upon civilization and the creation of new tastes are always to be considered. "We must look," as Mr. Rhett says, "to the *final* account of the whole matter—the question being, who *in the end*, whether directly or indirectly, in a little or a long time, makes the largest contribution."

If the lawyer, as Mr. Elliott says, is just as apt to bring about the wrong as the right decision, there being two sides to every question, would he not grant that the manufacturer is equally liable to defect of judgment and skill, to ruinous failures—or that there have been such things as *morus multicaulis* humbugs?

By viewing the subject in another light we shall arrive at a yet clearer perception of the error which lies in the supposition that the classes in question do not create money values—are merely dependants upon the wealth of those who do, which they appropriate to themselves—that the society is as wealthy without them as with them. "A man is rich or poor," says Adam Smith, defining wealth, "according to the degree in which he can afford to enjoy the necessaries, conveniences and amusements of life." Apply this definition to national wealth, and it must follow that a nation is richer in proportion to its means of obtaining these objects. When we speak of a man's having the means to enjoy any thing, we evidently do not mean merely that he has so much money or any thing else at his disposal which he can increase; for a man may have an abundance of money in a desert isle, and he would not be rich. He may have land, air, and water a plenty; but he would be poor if he had innumerable other wants which the gifts of nature could not gratify. He would be infinitely rich, though, if he could obtain all the objects of his desires in the same abundance as he can these gifts of nature. It is the same with a nation; its real wealth is increased when it can with greater facility enjoy the necessaries, conveniences, amusements and refinements of life.

Mr. Elliott, in proof of his opinion, puts the two cases, one of a society composed entirely of lawyers, doctors, &c.,—the other of a society all farmers; and argues that the former society could not live by their professional efforts; that they would forthwith dissolve in despair, because there would be no money values in such a community; but that the society of farmers would create values, could grow subsistence, and live. *

In the first place it does not at all appear, that a society so composed, could not subsist. It does in fact subsist before our eyes as a society: only we must not isolate it—we must not take away its materials. Neither could the possessor of so much gold and silver, were he a Crœsus, subsist, if you were to deprive him of a market—of food to purchase: neither could the society of farmers, if you take away the land from them. What applies to a small community or to a district, might equally apply to a nation. What are cities with their trades, colleges, inns of court, theatres, &c., but such societies? How much subsistence did not Athens draw unto her by her schools—by her arts? Can we enumerate the money values produced in the modern Athens, and in the cities of refined Italy?

In the second place the society of doctors, lawyers, &c., would be a much richer society than the primitive society of farmers.—They would not only produce money values with which to pur-

* Examination, (Southern Agriculturist, March,) page 116.

chase subsistence; but there would be an interchange among them of conveniences and enjoyments of which the society of farmers would be deprived. Were the wants of man limited to food, agriculturists would be the only producers; but as he has other wants in succession—clothes, conveniences, enjoyments, those who supply these wants are to all intents and purposes equally producers. Thus Mr. Say: "Production then is a creation, not of matter, but of utility, and it is measured by the value arising from the utility of the object produced. The utility of any object, according to general estimation, is pointed out by the quantity of other commodities for which it will exchange. This valuation, arising from the general estimation formed by Society, constitutes what Adam Smith calls value in exchange; what Turgot calls appreciable value; and what we may more briefly designate by the term *value*."

It is from this mistaken view of the nature of wealth, as consisting in a sum of money, or of money value simply, without any reference to the sum of necessaries, conveniences, and enjoyments obtained—to the quantity of them which this money or money value can purchase, and to the new money values thus realized, that Mr. Elliott has adopted the idea that these classes only alter the circulation of wealth—may diminish it—and do not increase it. To this effect he adduces the illustration of "the family of five boys who have a dollar apiece for pocket money. The elder wants something which the younger can do for him, or give him in exchange for his dollar. Now the younger is richer than he was, and the elder poorer, but the wealth of our little community has undergone no change, the younger is richer, but without new production."

It is true the *circulating medium* has, as yet, received no increase; but the community is richer by a dollar than it was before. The elder boy has still his dollar, for he is in possession of its real value; and the benefit which he has obtained may be, perhaps, worth more to him than the dollar—that is, the service rendered may have been of such a nature as to enable him to realize with it his dollar again, with re-production; and the younger has a dollar more than he had before. Can it be said that there has been no *production?* Without the production of something, the dollar would never have changed hands. But let us suppose that in this small community, instead of one, two of the boys discover this secret by which they can transfer the pocket money of their companions into their pockets: they would then rival and try to undersell one another, and, instead of a dollar, half a dollar might become the price for the service or amusement. Would not their community by this process be enriched? The value of the thing would be as great as before. If it was useful—a secret which would enable the possessor to get into the good graces of the father and to replenish his purse, it is very certain that the operation would be repeated very frequently,

and the two boys who now received only half as much as the one did formerly, would, in the end, have more in consequence of the increased demand among their fellows.

But it is not likely that a ballad singer would thus work upon the generosity of the father; yet he might be unwilling to deny his sons altogether the pleasure they would derive from spending a dollar or two in this way. If their pocket money was five dollars a month, he would probably limit them to once a month. But if two ballad singers appeared, and the amusement could be enjoyed for half a dollar, would not the boys feel richer? They would then have half a dollar more every month to spend upon some other object; for it would not follow that they would go twice a month to hear the ballad singer.

If we suppose one of the boys an agriculturist, and another a manufacturer, they might run away with the wealth of the others just as easily as the ballad singer. An extravagant passion for eating or dressing would also make them bankrupt; and the agriculturist and manufacturer would possess themselves of their wealth.

The end of all production is consumption. Any distinction between the necessaries and the enjoyments of life is vain. They are mutually exchanged, and exchange is the test of production. Were Mr. Elliott's illustrations good, a country with nothing but a home trade could never have originated a dollar of wealth. There would, according to his views, be *no* production. What would the planter do with his produce? Somebody must produce, like him, something which the planter would desire—for which he would exchange his products. Money was invented as the representative of these exchanges; but the planter, the wood-cutter, the stock raiser, the manufacturer, could not be producers, because like the ballad singer, they transfer from other's pockets into their own so much *money!*

We assert, on the contrary, that the home trade is the most important exponent of national wealth—that in proportion as a country has within itself the objects of exchange, it is the wealthier; and *in proportion as exchanges or productions multiply money increases, for it will be needed to represent and circulate these exchanges.* It will either be coined, or if the country has also a foreign trade, be in demand, and flow in to meet the wants of the circulation.

With an equal amount of capital, the home trade, according to Dr. Smith, produces a greater revenue, and gives greater employment than foreign trade.* though this Mr. Ricardo denies, asserting that two capitals may be employed at the same time in foreign trade as well as in home trade, and that consequently it would give the same quantity of employment.†

* Wealth of Nations, vol. ii., b. iv., chap. 1., p. 147.
† Ricardo, p. 377.

Taking into consideration the advantages of contiguity, intercourse, acquaintance with reciprocal wants, facility of transportation and exchange, the quick returns of capital—and, comprehending in the term trade—exchanges of all sorts, of immaterial services, as well as material products, of all objects of want, whether necessary or refined, which it would be impossible, from their nature, to procure from a distance, or to export in the same way as other commodities,—we cannot doubt that the home trade is far more important upon the whole—contributes in a much greater degree to the sum of necessaries, conveniences, and enjoyments, than the foreign trade. Its independence, too, secures to it greater favor. Capitals and employment are not as liable to receive the shocks which ruptures with a foreign market occasion.

Let not our argument be misunderstood. We would not be accused of the folly of contending that a State rich as this is in agricultural products, would, under circumstances like the present, be able to accumulate as much or more wealth from home trade alone, without an exporting trade. A country needs foreign trade when the home market is too narrow for its surplus products, or when it can exchange abroad its surplus commodities for other commodities not to be had, or had at as cheap a rate in the home market. But we contend that the State would be as wealthy or more wealthy without any exports, provided circumstances were so altered that the rude produce of the soil could be at once exchanged at home to as much or greater advantage than abroad for the necessaries, conveniences, and enjoyments of life.

The same rule that would apply to the rude produce of the soil or manufactures, would equally apply to the productions of the fine arts. If the market in Charleston were too narrow for the productions of the painter, sculptor, or opera singer, did the genius and spirit of the inhabitants incline to these professions as in the Italian cities, they would find demand elsewhere, or attract it to them at home. These individuals would either practice abroad and amass fortunes which they might bring back to their native city; or practising at home, as, under the supposition they would do, export their productions, if they were of a nature to be exported, and invite strangers to their market; and, if the latter were the case, the wealth of the community would be increased in a much greater degree, not only by the sums which these artists would amass, and spend in the encouragement of general industry, but by the additional sums which foreigners would disburse in other ways during their stay, to the increase of demand for all products, and by the sum of real wealth which a people of refined tastes and wants would be possessed of, together with the sums of money which these arts would invite to remain at home, and which are now squandered abroad in search after them, or their concomitants of society, refinement, and fashionable amusement.

(To be continued.)

For the Southern Agriculturist.

REPORT OF THE COMMITTEE OF THE BARNWELL AGRICULTURAL SOCIETY, ON THE CULTURE OF COTTON.

Read at their Annual Meeting, on 11th November, 1840.

In reporting on the cultivation of Cotton, the great difficulty with the Committee, has been, to determine what topics to exclude, so as to be as brief, as is requisite for the occasion. To discuss, *at large*, the different qualities of soil, best adapted to this plant—the various methods of preparing the land, and planting—the working, gathering, and preparing for market—the making and applying manures—the rotation of crops, raising stock, and management of negroes—all of which might be embraced, as intimately connected with the subject—would be more fatiguing than improving. The Committee prefer to touch only here and there, upon these topics, and at the risk of appearing somewhat desultory and unconnected, will refrain from a full and systematic investigation.

It must be premised, that there are two very different plans of applying labor to the culture of Cotton, both of which are followed successfully, as is supposed, in our District. These may be called the upper and lower country systems, from the sections in which they originated, and are in general use. The one goes upon the principle of economizing labor, by applying animal power, and developing the full resources of the soil: and where provisions are easily made, and land abundant, it has been found to work well. The other dispenses as much as possible, with animal power, economizes in provisions, and husbands for a future generation the vigor of the soil—or *aims to do it.* Both include manuring, as much as can be done conveniently, but more is probably done, by planters who adopt the latter. That more cotton is made by the up country plan, experience has demonstrated beyond question, in both sections; whether it is made more cheaply, and (what is most important,) brings more clear money to the pocket of the planter, depends so much upon the particular circumstances of each individual proprietor—the character and extent of his land—the adaptation of the climate to provision crops—the number and training of his laborers—and his own tastes and habits, that it is almost impossible for any general rule to be laid down. One of your Committee has used and discontinued the lower-country system, the other has done the same with the up-country one. Perhaps it is worth the while of every individual, to make the same experiment once in his life, and we recommend it particularly to all, who are unsuccessful under their present system, whichever it may be.

Your Committee agree, that with any kind of culture the mulatto pine-land, (as it is commonly called,) with a clay bottom, is the best in our section of country, for Cotton, or perhaps any thing else. The Indians even, seemed to have agreed on this; for most of the Indian old fields, are of this kind of land. It has been lately analyzed by Professor Shepard, at the request of the Agricultural Society of St. John's Colleton, and found to contain a large comparative proportion of carbonate of lime, from which, no doubt, its fertility in a great measure results. The clay bottom to this, and all other land, is certainly an advantage, as it assists in preserving the salts of manure, and to keep up, in ordinary seasons, a due degree of moisture. In very wet ones, such as this, however, it retains too much for the light soil above, and in very dry ones, such as the last, it seems to arrest the moisture which might otherwise arise from the depths of the earth. This land and any land, is better for cotton, when a little undulating. The sun, the great chemical agent in vegetation, has then more effect on it.

The ground cannot be too well prepared for Cotton. If it has rested one year, it should be broken flush, as early in the previous fall as possible, and bedded just before planting. If it has rested two years, or been planted the preceding year, let it be listed, as early as it can be done, and two furrows thrown upon the list. Immediately upon planting let two more furrows be thrown up, and the balk broken out completely. The common method of running three furrows, and planting on it, throws the winter's portion of the crop-work upon the laborer, during crop time, and is inexcusable, unless heavy clearings are absolutely required. The reason for not listing after one year's rest, is, that the vegetable matter will be too abundant, and too coarse to form a substratum to receive the tap-root.

Cotton should be planted early. It may increase the difficulty of getting a stand, and give the plant for a long time, a puny appearance, but every stalk of cotton, planted in March, or the first week in April, that survives, may be readily distinguished, in any field that has been re-planted later. It bears more, and earlier, and stands all the vicissitudes of June, July, and August, better. There are several methods of planting. Your Committee recommend planting in spots, regularly measured by the hand dibble. It is somewhat tedious, though less so than generally supposed, and certainly does not take as much time as both to drill and chop out; nor is time so valuable at that period, as when the latter operation is required, while a better and more regular stand may be secured.—There is no land, or but little in our district, in which cotton rows should be over three feet apart, or the cotton further than fourteen inches in the drill—one plant in a place. To make a large crop, there must be an abundant supply of stalks. When the weather is

too wet to plant, time may be often saved, by dropping the seed, but not covering until the ground is dryer. If, however, it cannot be covered in three or four days, it is time lost, for it must be replanted. Always cover lightly, under any circumstances. And always plant on something of a bed, in any land. It keeps the cotton dryer and affords more air when it is young. It enables you to get at it in working. By increasing the surface, it absorbs more moisture, if it is too dry; and gives out more if it is too wet, and in both cases gives you the advantages of a vertical sun, on the tap-root, which hastens the maturity of the bolls—a vast desideratum in our climate. On this account the bed can hardly be drawn too high at the last hoeing, in any season.

In cultivating Cotton, whether with the plough or hoe, the chief object is to keep down the grass, which is its greatest antagonist, bringing all, or almost all other evils in its train. It is not so essential in the opinion of your Committee, to keep the ground stirred, as is generally supposed, and by no means requisite to stir it deep —at all events, not in our light soil. If it be well prepared, deep ploughing is not only unnecessary for any of our crops, but often highly injurious to them, while it rapidly exhausts the land, by turning it up fresh, under a burning sun. Much unnecessary pains is usually taken, and time lost, to work the plant in a particular way, under the supposition that it is a peculiarly delicate one. If it survives its infancy, few plants are hardier. It is often found to reach maturity in the alleys, where the mules walk, with the ploughs following and the laborer tramps backwards and forwards. Sometimes it will bear fruit, in turn-rows used frequently for wagons, while it really seems to derive benefit from being bitten down almost to the ground, by animals—it will bear almost any usage, better than it will that mortal enemy—grass.

The most critical operation in working Cotton *is thinning*. It should be done with great care, and if early, with the hand. In a dry year, it cannot be done too soon after the plant is up. In a wet one, it may be profitably delayed, until it has begun to form, or later even. On the experience, observation, and judgment of the planter, in this matter, every thing depends, as each year brings its own rules with it. Where circumstances are favorable, early thinning is of course the best. Some planters always top their cotton. Others never do. Your Committee are of opinion, that it seldom or never does harm, to do so. But whether it is worth the trouble, is a doubtful question. Those who have no clearings, or other important employment for their hands, would lose nothing, by devoting three or four days to this operation early in August. Those pressed for time, might gain by omitting it.

Too much pains cannot be taken, in preparing Cotton for market, for they are all well remunerated by the additional price. The first thing to be attended to, is to have it gathered free of trash.—

With a little care, wonders can be effected in this way; and hands with a short training, will pick almost if not quite as much, without trash as with it. It should never be gathered when wet. And here it may not be out of place to remark, that one of the very best sanitory rules of a plantation is, never before frost, to send out your hands to pick, until the dew has nearly or quite disappeared. It saves time in the long run, as well as health and life. Cotton should never be ginned, until the seed are so dry, as to crack between the teeth. If damp, it is preferable to dry it in the shade, as the sun extracts the oil and injures the staple. If, by accident, however, it gets wet, there is no alternative but to put it on the scaffold. It is of great importance to sort the cotton carefully, into its several qualities, in ginning and packing, for by mixing all kinds together, the average of the price is certainly lowered. A few old hands, or very young ones, breeding women, sucklers, and invalids, will earn excellent wages in a gin house, at this occupation. Neat packing is of no small importance, in the sale of cotton, and no little taste may be displayed, in making the packages. The advantage of square bags, is universally known, and the Committee are astonished that any other should ever be made now.

Every kind of manure is valuable for Cotton. Every kind of compost, green crops turned in, cotton seed, and even naked leaves listed, and left to rot, improves this crop. When planted on cotton seed, and sometimes on strong stable manure, it is more difficult to retain a stand, owing probably to the over stimulus of these manures. So, on leaves, unless well rotted, the Cotton will long continue to die, in consequence of the leaves decaying away and exposing the root too much to the sun and rain. These difficulties may be avoided, by a little pains, and by no means justify the opinion entertained by some, that Cotton should never be planted on fresh manured land. The only question is, the cost of the manure. A great deal may be made on every plantation, without much trouble or expense, by keeping the stables and stable-yard, hog and cow pens, well supplied with leaves and straw. And also from pens of corn-cobs, sweepings from negro and fowl-house yard, and the rank weeds that spring up about them, collected together and left to rot. Whenever the business is carried further, and a regular force detached to make manure, at all seasons, and entirely left out from the crop, it becomes the owner, to enter into a close calculation of the cost and profits. In many agricultural operations, such a course, the experience of all countries has proved to be profitable, but these operations partake more of the farming and gardening, than planting character, and whether the same method will do for the extensive planting of short staple cotton, remains, in the opinion of your Committee, yet to be tested. If any thing like an average of past prices, can be maintained, it is certain that more can be made by planting largely, than by making manure

as a crop. If, however, prices continue to fall, and the growing of cotton be confined to a few rich spots—those susceptible of high manuring—then our whole system must be changed, our crops must be curtailed, and staple—labor losing its past value, the comparative profit of a cotton and manure crop, will preponderate in favor of the latter. As a substitute for manuring on a large scale, resting and rotation of crops is resorted to. In our light level land, the practice of resting cannot be too highly recommended, and by a judicious course—such as resting two, and planting two, or at most three years, our lands may not only be kept up forever, but absolutely improved. From rotation of crops, but little advantage is gained for cotton. After small grain, whether from the exhausting nature of that crop, on light lands, or becanse the stubble keeps the ground always rough and porous, cotton will not do well. After corn it is difficult to tend, as from our usual manner of cultivating corn, grass is always left in full possession of the field. It does best after cotton, or after a two year's rest. Rest is the grand restorer, and the rotation chiefly required in the cultivation of cotton.

It may not be out of place to state here, that in the opinion of your Committee, no other kind of labor can be profitably employed in the culture of Cotton, than *slave labor* in this country. The expense of machinery and carrying to market, renders it unprofitable, with but one or two laborers, which are all that one free family, can in general supply, while it is almost impossible, to carry on the steady and unvaried operations of a Cotton plantation, with such hirelings as can be obtained here. An irresistible necessity must fix them in the occupation. Whether that necessity be the open and legalized slavery of this country, or the equally imperative exigency which forces the Irish peasant, and the Indian ryot, to labor without ceasing, as the sole condition of existence, makes but little difference. It is said that free labor, by which, no doubt, is meant such labor as this latter, is the cheapest. It would seem, indeed, where the labor of an able-bodied man can be commanded at any moment, for a pittance that barely suffices to keep soul and body together, that it would cost less than to support the same man in sickness as well as health, in good or bad seasons, to nurture him when young, to support him when old, and at all times to furnish him with good food, comfortable raiment, and safe medical assistance, and to do likewise for the feeble and decrepid of his family. It is undoubtedly the case, so far as the agriculturist, only, is concerned. But what is done by him for his negro slaves, must be done to some extent by the community at large, for the equally helpless *free* laborer. Poor laws and alms-giving shift from the agricultural to the other classes, the burden of keeping him alive, and supporting his family, when his services are not needed, or he is unable to render them, and it is only inasmuch as

he is worse lodged, clothed, and fed, than the negro slave, or is cut off by starvation or disease, before he has ceased to be able to work, that the cost of his labor, is in reality less than that of the slave, to the community at large. Let the philanthropists of other countries, enjoy the advantages of such economy as this, and thank God that they are not as other men. We are content to follow the example of the ancient patriarchs—to uphold the institutions regulated by the inspired lawgiver of the Old, and neither abolished nor condemned, by the immaculate Author of the New Testament; well pleased to pay a higher price for our labor, if it goes to prolong the life, or increase the comforts of that invaluable class, which has existed, and is destined to exist in all times and countries, whose lot it is, literally "to earn their bread by the sweat of their brow."

Your Committee cannot conclude these desultory and incomplete remarks, without adding, that with every care and attention, in the cultivation of Cotton, after the adoption of every improvement, and using the utmost economy in every arrangement, there is no planter in our section, if there be any in the State, who can make the legal interest of 7 per cent. per annum, on his investments, by planting Cotton, at present prices. There are very few of them, on our best lands, who can realize this much, at 10 cents per lb. nett, and not many who can do it at 12 cents. If prices do not improve, most of us will be compelled to abandon Cotton. If they fall lower, it will be difficult to say who can plant, in this section, at least. A very few years more, will decide our fate. It will be the part of wisdom to go on, and endeavor to perfect the art of planting, that we may be able, if it is possible, to compete with richer soils, and more congenial climes; but it would be folly, if we did not, at the same time, look around us, to see what our country is capable of yielding, and encourage liberally, every effort, to develope our resources, diversify our productions, and introduce new staples.

J. H. HAMMOND, *Chairman.*

For the Southern Agriculturist.

PROCEEDINGS OF ST. LUKE'S AGRICULTURAL SOCIETY.

Mr. Editor:—In conformity with a Resolution of the St. Luke's Agricultural Society, recently organized, I herewith send you for publication at as early a date as possible, the proceedings of a meeting of said Society.

Your most ob'dt. serv't., WM. POPE, Jr.

At an adjourned meeting of the citizens of the lower part of St. Luke's Parish, convened at the Board House on North May River,

on the 7th day of April, 1841; on motion, JOHN STODARD was called to the chair, and WM. POPE, Jr., appointed to act as Secretary.

On motion, *Resolved*, that the Ministering brethren present, be invited to open this meeting by prayer. The Rev. HEMEN M. BLODGET was accordingly invited, and addressed the Throne of Grace in a very suitable and appropriate manner. After which, the meeting was declared ready to enter upon the important duties for which it was called.

The Society was declared organized, and called the St. Luke's Agricultural Society.

The Committee appointed at a previous meeting to draft a Constitution and By-Laws for the government of the Society, made their Report, through their Chairman, N. P. BROWELL, Esq., which was carefully read once, considered, and adopted, as follows, to wit:—

PREAMBLE.

WHEREAS, by a continued course of cultivation, the original fertility of our soils have depreciated to such an extent, that we are literally fulfilling the command to "earn our bread by the sweat of our face," in its broadest sense; and being deeply impressed with the importance of associations in agriculture, the great base of our individual and national prosperity, and the mutual benefits to be derived from a frequent interchange of opinions. Also, to elicit the benefit both private and public, that result, not only from deliberations, but from practical experiments in agriculture, to take advantage of the light the sciences have shed on this interesting subject, as well as to keep pace with the progressive improvements of the age, and other sections of our country, do form ourselves into a Society to be called the St. Luke's Agricultural Society.—We therefore pledge ourselves to the following Constitution and By-Laws:—

The objects of the Society shall be—

1st. To collect and disseminate all useful information, theoretical and practical, as has been proved by experience, useful to the cultivators of the soil.

2d. To correspond with other Societies at home and abroad, and to solicit information on all subjects likely to lead to practical benefit in our section of country.

3d. To encourage improvement in agricultural implements. In the construction of plantation buildings. In the selection and care of live stock. In the making and application of manures; and the benefit to be derived from science, as connected with the various purposes of agriculture.

4th. To promote the discovery of varieties of cotton, corn, grains or roots, useful to man or food for domestic animals. Also to the cultivation of silk.

5th. By the distribution of prizes, to encourage the best mode of farm cultivation, and breeds of live stock, and by this or other means to excite emulation; to improve and elevate the character of overseers, and on all other subjects connected with rural improvement.

CONSTITUTION.

ART. 1st. The Officers of the Society shall consist of a President, a Vice-President, a Treasurer and Recording Secretary, and a Corresponding Secretary. To be annually elected by a majority of the members present, (provided the same shall be a quorum,) at the anniversary meeting.

ART. 2d. In case of the vacancy of either, an election may occur at any other meeting than the anniversary, to fill such vacancy till the annual meeting.

ART. 3d. The Vice-President shall act in the absence of the President, and any member, on motion, when both are absent.

ART. 4th. At the meeting of the Society, the President shall take the chair, call to order, open the meeting, put the question on all motions, and declare the decision thereon. He shall have the power to call special meetings by giving public notice thereof fifteen days. In his absence the same power shall be exercised by the Vice-President.

ART. 5th. A quorum to do business shall consist of five members.

ART. 6th. The Treasurer shall keep a book and have the amounts regularly stated, and shall pay all orders of the President; he shall produce his books for inspection when called for by the Society, and shall turn them over with all the papers and funds appertaining thereto, to his successor in office.

ART. 7th. The Secretary shall keep a book and faithfully record the proceedings of each meeting, and at the expiration of his term of office hand over his official records to his successor.

ART. 8th. The Corresponding Secretary shall have charge of all letters addressed to the Society, and answer the same under their direction, which correspondence he shall regularly record and file away. He shall produce his official records when required by the Society, and hand them over to his successor in office.

ART. 9th. The stated meetings of this Society shall be on the second Wednesday in May, July, September, November, January and March, and the second Wednesday in May next shall be celebrated as its commencement, and each succeeding Wednesday in May, shall constitute the Anniversary of this Society.

ART. 10th. No person shall be elected a member of this Society without the vote of two thirds of its members present.

ART. 11th. The Members of this Society shall pay to the Treasurer at each anniversary meeting, the annual contribution of two dollars.

ART. 12th. The President shall have power to appoint at any time, if deemed necessary, a Committee of Vigilance, said Committee to be subject to the discretionary orders of the Society.

ART. 13th. There shall be a Committee, whose duty it shall be to examine all crops offered for premiums, or live stock, &c., and to make a report thereon, together with all other important facts that comes within their observation.

ART. 14th. It shall be the duty of said Committee to award such premiums as the Society may direct, on crops, live stock, manures, &c., and the Society shall determine on the amount of awards at each anniversary preceding the anniversary for exhibition.

ART. 15th. Whenever two thirds of this Society may deem it necessary, such majority may alter or amend the Constitution and By-Laws thereto annexed.

ART. 16th. The initiation fee of this Society shall be one dollar.

ART. 17th. The funds of this Society shall be exclusively applied to the purchase of live stock, implements of husbandry, seeds, premiums, and the subscription for Agricultural Periodicals.

After the adoption of the above, the Society was declared fully organized, and went into election for officers, when the following was the result:—Dr. JEREMIAH FICKLING was elected President, the Rev. H. M. BLODGET Vice-President, WM. POPE, Jr., Treasurer and Recording Secretary, and N. P. BROWELL, Esq., Corresponding Secretary, for one year.

On motion, *Resolved*, That the proceedings of this Meeting be forwarded to the Editor of the Southern Agriculturist for publication.

On motion, *Resolved*, That the thanks of this Society be tendered to our Chairman and Secretary, for the impartial discharge of the duties of their office,—and adjourned.

For the Southern Agriculturist.

EXPERIMENT WITH BROWN CORN.

Mr. Editor,—Influenced by the numerous reports in favor of the *Brown Corn*, (thus called in the eastern States,) which I met with, from time to time, in the agricultural papers, I was induced to avail myself of your kindness, to procure a small quantity for seed. You accordingly obtained for me a bushel, with which the following experiment was made.

The piece of land upon which the Corn was planted, contains about an acre and a half. It is somewhat low and wet, but well drained, being surrounded by drains upon three sides, and intersected, through the middle, with two others. The soil is a dark sandy loam, with a substratum of blue clay, and produced last year a good crop of Corn, (Cooper's prolific, and Carolina flint.) Last fall it was well turned over with a large two-horse plough, and then harrowed. In April, being low, it was thrown into beds, four feet from centre to centre, by throwing five furrows together, afterwards smoothing the beds with the hoe. The tops of these beds were opened and received a good supply of stable manure upon the centre, upon which the Corn was drilled and carefully covered, in April. Notwithstanding the season was dry, the seeds came up in due time; but as a large proportion of the plants were cut down by the worm, it became necessary to replant the missing places. In this way, a fair stand was obtained.

At the first working, the sides of the beds were thrown from the Corn, by passing a single mould-board plough, with the left, or bar, side, next the Corn, the alleys being then ploughed in the ordinary way. The hoe hands followed to thin the plants, and haul up the beds. It afterwards received two workings with the cultivator and hoes, by means of which the ground was kept clean, and well pulverized—the early part of the season, May and June, being very dry.

Much of the Corn tasseled when not more than three feet high, and although numerous shoots and suckers were thrown out, not one of them formed what might be called a good ear. Add to this, the depredations of worms, which on account of the proximity of the ears to the ground, committed great ravages upon them, and we have one reason, perhaps, why the product was so far beneath our expectations. The truth is, after the labor that was bestowed, and the high hopes created by the flattering accounts published *Down East*, in favor of *Brown Corn*, the whole crop did not yield ten bushels, and what little was produced, consisted of small worm eaten nubbins, scarcely fit to feed hogs.

As we cannot call in question the truth of the favorable reports published in the eastern papers, in behalf of this variety of Corn, the conclusion, from the results of this experiment, is irresistible, that our climate and soil are not congenial to it, and like all the dwarfish Corns of the North and East, it is far inferior, in the low country of Carolina at least, to the varieties that we have long been in the habit of cultivating. G.

BONE DUST.

Bones, which have now become a very important manure, are composed of earthly salts, chiefly phosphate of lime, with a little carbonate of lime, phosphate of magnesia, and about one-half of decomposable animal matter. Those of fat young animals are allowed to be the best.* They are less beneficial for clay lands than light soils, and less efficacious in wet than in dry seasons. In the improved districts of Scotland, bone-dust is coming into very general use as a manure for turnips, and mills for crushing bones are general in many parts of the country. There has been no improvement in Scottish agriculture so universally adopted as that of applying bone-dust to land intended for the production of turnips, and it seems better qualified than any manure hitherto tried for bringing waste land into cultivation. It is light, and can be carted to a great distance at little expense, one wagon load of 100 bushels being found nearly equal to forty cart-loads of farm-yard manure. It is asserted by some, that its efficacy remains during the whole rotation, and even after it. On pastoral farms it will be found exceedingly useful; as, raising a better crop of turnips, it will greatly improve the condition of the stock.

In corroboration of the above remarks, we quote the following:— "A farmer obtained a forty years' lease of a tract of poor land in a high situation near Rochdale in Lancashire, on which, after fencing and draining, he erected a bone-mill, and began manuring the land at the rate of from one hundred to one hundred and thirty bushels per acre. The consequence of this was, that he let off, in a few years, more land than paid the rent of the whole, and retained a large farm in his own hand."†

In the wolds of York and Lincoln shires, it is stated that "before bones were extensively used in turnip husbandry, many thousands of acres were annually sown for that crop without any manure whatever. The turnips upon such unmanured land were consequently very indifferent, and the benefit of feeding sheep on their tops was very trifling. But since the use of bones has become general, the turnip crop has increased tenfold. All the succeeding grain crops have been much larger, and upon the four or five shift system, there is no doubt the land will go on progressively improving, requiring a less quantity of bones annually, from its increased fertility and power."‡

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*The following table gives the ordinary proportions of the ingredient composing bone dust:

Earthy and saline matter,	40	parts in 100.
Cartilage and jelly,	40	
Fatty matter,	20	

† Journal of Agriculture. ‡ British Husbandry.

From experiments made regarding the efficacy of bone dust contrasted with farm-yard dung, on soils of a light sandy nature, the result has been uniformly in favor of the first, one and a half tons of bones being equal to twenty tons of dung. To ascertain the effects of large and small quantities, from twenty to one hundred bushels per acre, in various amounts, have been applied, and it has been found that the crops are not increased when laid on beyond a certain quantity. By being applied in large quantities, although not immediately beneficial, bone dust has been found to render land extraordinarily productive for a great length of time. We quote the following rules for its application:

"1. On dry lands, lime stone, chalk, light loams, and peat, bones are a highly valuable manure. 2. That they may be applied to grass with great good effect. 3. That on arable lands, they may be laid on fallow for turnips, or used for any other subsequent crops. 4. That the best method of using them when broad-cast, is previously to mix them up in compost with earth, and let them lie and ferment. 5. That, if used alone, they may be either drilled with the seed or sown broadcast. 6. That bones which have undergone the process of fermentation, are decidedly superior in their immediate effects to those which have not been fermented. 7. That the quantity should be about twenty bushels of dust, or forty of large bones, increasing the quantity if the land be impoverished. 8. That upon clays and heavy loams, it does not yet appear that bones will answer. On this latter observation, however, a farmer near Nantswich in Cheshire remarks, that he 'occupies a farm in the township of Pickmore, the soil of which is a clay loam scarcely twelve inches deep, the subsoil a gray sand mixed with coarse clay, on a bed of good clay marl. Two years ago he covered a field with bone manure, previous to which the grass was so sour as not to be worth ten shillings an acre; but it is now full of most excellent herbage, consisting of white clover, and trefoil.' To this he adds, 'that on another of his fields with a clay soil, a small portion of it was manured thirty-two years ago by a former tenant with bones, and that although it has been twenty years in tillage, yet that part still shows a superiority over the rest.' At Clumber Park, the seat of the Duke of Newcastle, six hundred bushels of small bones were in 1822 spread upon twenty-four acres of grass land in the dairy farm, consisting of dry, sandy, and gravelly soil, which had been laid down about ten years. Their effect upon the pasture improved the condition of the cows so materially, that about twice the quantity of butter was made from them than from cows grazed on land of a similar quality, but not boned; and this effect, it is said, still continues. The time for laying them upon the land as a top-dressing to grass, whether seedling or pasture, is generally recommended to be early in spring. Seeing that the fertilizing quality of bones is improved by fermentation, it has led to the

supposition that they may be usefully applied in compost with earth and other substances; by this mixture it has been found from experiment that they soon become decayed and pulverized. It is stated in the Doncaster Report, 'that this method of using bones in the formation of composts is recommended by several intelligent farmers, thirteen of whom, solely from their own experience, described its effects as superior to those of bones used singly. With some of these, it is the practice to mix fifty bushels of bones with five loads of burnt clay or good earth per acre, by which dressing, the crops between fallow and fallow, except clover, appear to be increased one-fifth in value."*

[*Jackson's Treatise on Agriculture.*

RESULTS OBTAINED FROM THE USE OF LIME AND MARL ON THE SANDY POINT ESTATE.—BY A. NICOL.

Before the year 1831 very little lime had been used on any portion of the estate; and from that period up to the beginning of 1840, one hundred and seventy acres on the Rowe farm, two hundred and sixty on Teddington, and ninety on the Neck farm, equal in all to five hundred and twenty acres, had received a dressing of oyster shell lime, at a rate per acre varying from ninety to one hundred and twenty bushels, or in all, as near as can now be ascertained, equal to three thousand hogsheads of shells. The annual applications were given to the fields planted in corn; and selecting the poorest or least productive portions of these fields, and consequently on detached portions of each farm. The benefits resulting from the application have been most decided; the increased growth of weeds, clover, corn and wheat, point out each application as distinctly as if each were separately fenced off. The increased products on these particular spots have not been accurately ascertained or noted; but when, by the eye comparing them with surrounding land not limed, the increase is not less than double in corn and threefold in wheat and clover, and gives ample encouragement to persevere in its application. In addition to the above quantities of shell-lime used during the period above mentioned, from one thousand to twelve hundred bushels of marl were brought over from the opposite side of the river, in Surry county, where there are extensive deposites of marl, and were applied to a corner of a field on Teddington. The quantity of lime contained in the marl was not known, nor is it now recollected how much was applied per acre; supposed to have been a slight dressing; and as probably all of the corner of land so marled,

* British Husbandry.

from its near vicinity to several houses, has had ashes applied to it occasionally, it is doubtful how much improvement may justly be attributed to the application of the marl. The crop of clover on it of this season is equal, if not superior, to that on adjoining limed land.

In 1840 the purchase of calcareous matter was largely entered into on this estate. Seventy-six hogsheads of oyster shells were purchased at 75 cents per hhd., $57 00, and one thousand nine hundred and sixty-two hogsheads at 70 cents, $1,373 40; in all, two thousand and thirty-eight hogsheads, costing $1,430 40. In addition to these, ninety casks of northern stone-lime were purchased, costing 90 cents per cask, $81 00; and early in the season, a contract was entered into for a supply of forty thousand bushels of marl, from a bank on the Surry side of the river, distant about seven miles, for 4 cents per bushel, and of which twenty thousand bushels were delivered during the year, making the cost of marl for the year $800 00; and in all, for marl, stone-lime and shells, a total of $2,311 40. Of the above quantities not more than three hundred hogsheads of shells were burned, and applied to the soil in 1840, at the rate of from one hundred to one hundred and twenty bushels per acre, all of the stone-lime at the rate of sixty bushels per acre, and five thousand two hundred bushels of marl, at the rate of one hundred and thirty bushels per acre. (A large application of lime and marl was made early this year, and which will be referred to in a subsequent communication.) The above quantity of marl will appear to many a very slight application. When the contract was entered into, the contractors stated the strength of the marl to be 85 per cent. of lime; and no doubt they were correct, so far as a particular selected specimen was concerned; but not so as regards the general body of marl, which, from subsequent analysis, proved to be only 63-100. Our subsequent applications have consequently been increased so as to give upwards of one hundred bushels of lime per acre; the object for the present being to give as large a surface as possible a speedy dressing. Improvement to the soil will in the meantime be progressing; and an increased application will immediately follow. Considering the facilities, which the deposite of marl presents from which this supply is obtained, for digging, the short distances it has to be lightered, as also the facilities afforded for speedily discharging a cargo, on various points of the estate, 4 cents a bushel may justly be considered a high price for this marl. The then existing circumstances which induced the contract, however, justified the giving of that price, rather than suffer disappointment by not obtaining a necessary supply in due season. The same marl, of equal quality, and from the same deposite, is now offered at a reduced price.

The application of shell-lime on this estate is very expensive. The wood necessary for burning the shells has to be carted a

distance of from two to three miles; and it is estimated that each bushel of lime, when ready for application to the soil, costs not less than 12 cents per bushel; and it is also estimated, that an equal quantity of lime per acre will be furnished from marl at 60-100, costing 3 or 3½ cents per bushel at about one-third the expense of shell-lime. It is in contemplation to discontinue the use of the latter here beyond the supply of shells now on hand, and use the marl in preference, if it shall be found, after a fair trial, to act equally well on the soil, and marl of that strength can continue to be procured, in sufficient quantities for the demands of the estate, at not more than 3 cents per bushel.

A dressing of calcareous manure was given to a twenty-acre lot previous to planting corn in 1840. On one half of the lot shell-lime was applied at the rate of one hundred bushels per acre; on the other half marl at the rate of one hundred and thirty bushels containing 63-100 of lime. The crop of corn was much injured by the ravages of the cut worm. Until late in June no difference was observable on the crop between the shell-lime and marl, nor was any observed on the succeeding crop of wheat, recently reaped; and the young clover now stands equally well over the lot.

On another portion of land, of little over twelve acres, immediately in front of Teddington barn, after a dressing of rotted manure, shell-lime, at the rate of one hundred and twenty bushels per acre, was applied, previous to planting corn, also in 1840. This portion of ground, though of fine texture of soil and well located for receiving occasional aid from manure, had failed comparatively for several years to produce a crop of either corn or wheat. The crop of corn last year was judged to be equal to thirty or thirty-five bushels per acre, and the crop of wheat reaped this season as being not less than fifteen bushels per acre. The benefits to this portion of ground have consequently been highly satisfactory; the stand of young clover is now very fine.

In preparing the corn field on the Neck farm in 1840, twenty acres on one side of the field, considered as being too poor to produce a crop of corn, had a dressing of manure from the stable yard applied to it, and a crop of oats sown. This crop resulted miserably, not even sufficient to cover the ground; what was of them were ploughed down soon after ripening, and from which a scanty volunteer growth presented itself. In the fall, previous to sowing wheat, fifteen acres of it received a dressing of shell lime at the rate of one hundred bushels per acre. On the 7th November wheat was sown on the portion limed, as also on that not limed, and which had the equal benefit of manure, and on a portion of it a tolerable crop of pea vines ploughed under. The adjoining land, which had been in corn, and separated only by a water furrow, was also sown on the same day. From the earliest stage of the

growth of the wheat, that on the limed portion kept far in advance. The crop reaped from it this season was heavy, and considered to be equal to twenty five bushels per acre; while that on the portion of the twenty acres not limed has certainly not produced an average of more than five bushels per acre, and was considered as being formerly the best portion of the twenty acres, all of which previous to liming would not probably have produced an average of four bushels. The crop of wheat from the adjoining land which had been in corn, and formerly considered as being greatly superior to that portion limed, produced a crop whose average will little if any exceed from eight to ten bushels per acre. A more striking instance of the benefits resulting from the application of lime I have never seen. Can the most sceptical desire a stronger proof, or its advocates a more gratifying result? Other results will subsequently be reported. In the mean time, I remain your humble and obedient servant,

A. NICOL.

[Farmer's Register.

ON TOP-DRESSING.

Mr. Editor,—When I first read the article at page 84 of the present volume of the Cabinet, on top-dressing, I thought, indeed, that it was all *theori*, as my friend and neighbor Parnell calls it, and was astonished that any one could advocate a doctrine so foreign to all our past experience, and in the very teeth of every work on agriculture, all of which inculcate the absolute necessity of keeping our dunghills covered with earth, to prevent the escape of the gases, and the loss of about one-half the value of the manure; and upon spreading, to turn it in immediately, for the same best of all reasons; and, as I say, I did heartily despise the notion of top-dressing, much as your correspondent A. had to say in its behalf. This was in the autumn of last year, and up to February of the present spring, I had not changed one jot of my opinion or lost an atom of my prejudice; but, turning by chance to the article, as I sat by the fire-side one cold and comfortless evening, when I had leisure to examine and reflect upon what he had advanced five months before, a thought struck me, that I could try for myself the truth or error of the scheme, and that I ought to do so, for the benefit of those who had it not in their power to make the experiment so easily as I could; and I therefore came to the resolution to give the thing a fair trial and report upon it in the Cabinet, which I am now prepared to do.

In the upper part of one of my fields I have a gravelly bank with scarcely two inches of mould upon it; there the crop, of whatever kind, had always been poor, even after the most careful cultivation —the hungry subsoil permitting whatever dressing was buried in it,

quickly to pass away: I therefore ploughed it as deep as I was able, and immediately sowed upon it a portion of oats; I planted Lima beans on another portion as also some of the emur, mentioned in the last pages of the Cabinet, and immediately covered the surface with the sweepings of the streets, to the thickness of an inch or an inch and a half, and "said nothing to nobody," as I was fearful my neighbors would have enjoyed a laugh at my expense, had they seen me expose a coat of manure "to be dissipated by the winds of heaven," &c. This was late in the month of April, and on this, the 20th day of June, I find upon this hitherto worthless portion of my land, crops that far surpass any that I have ever grown on land of ten times its value, and which have borne the late drought without flinching in the least. On turning up the dung, I find the earth underneath always moist—it seems to operate as a sponge, to hold the evaporation which rises from the subsoil, and to prevent its escape; and the weeds which were indigenous to the soil, appear not to have vegetated, but are kept in abeyance by the heavy crops with which the ground is covered. I need not say that I very often visit my experimental plot, and am more and more convinced of the superior value of top-dressing, on such soils at least, and am free to confess that my mind is now open to conviction. On the most careful examination, I cannot perceive that the coat of manure is at all lessened in bulk by either the rains or exposure; but I *can* perceive that a shower, which carries the water impregnated with the dung to the roots of the plants, causes them to start away in the most remarkable manner—indeed the immediate effect is surprising. I am, therefore, so far as the present experiment has taught me, convinced of the great advantage of top-dressing: will others try it? I am preparing to sow beet after rye, and shall cover the rows where the seeds are sown, with well-rotted street manure as a top-dressing, instead of burying it in the rows, as heretofore directed, and have no fear of obtaining a good crop.

JOHN KINSON.

[*Farmer's Cabinet.*

SWINE—THE WOBURNS.

To the Editors of the Cultivator—In your July No. there is an inquiry by A. C., about the Woburn hog, and a request from you that I should reply, and would accompany the reply with a correct plate. I will now proceed to reply.

The Woburns that I have, were first introduced into Kentucky in 1829, by a merchant of Winchester, (Ky.) Shortly after their introduction, I procured of him a pair of pigs, and after his death, which happened in 1833, I purchased his old sow, which I called Pennsylvania. In 1837, I procured three hogs of the same breed

from Virginia, accompanied with a certificate that they were pure blooded hogs of the "*Duke of Bedford's breed.*" These three were called Belmont, Belmona, and Accident.

These hogs, when I got them, were called indiscriminately Bedfords or Woburns. But after an extensive trip through Pennsylvania, New-York, Massachusetts, and other states, looking for them, and finding the hogs generally called Bedfords in those states, were not the same kind of hog, I called mine *entirely* by the name of Woburn, to distinguish them from the numerous varieties of Bedfords.

Three or four years ago, Mr. John Blackman imported from England three pigs of the Woburn breed; they were thin fine haired hogs, and I expect it is from these that the pigs spoken of by your correspondent have originated. Those hogs of Mr. Blackman's had the form and appearance of Woburns, except in hair, of which they were nearly destitute, showing a deep cross of the Neapolitan hog. So much for his first question.

To the second, as to size and disposition to take on flesh when compared with Berkshires? I would answer that the warmest advocates of the Berkshires admit that the Woburns are larger. I have tried many experiments as to their fattening qualities, all of which have resulted greatly in favor of the Woburns. An experiment was made in Jessamine county, Ky., by Isaac and William Barclay. They fed a Woburn and a Berkshire boar for thirty days, to ascertain which would gain most. Wm. Barclay was a strenuous advocate of the Berkshire, and Isaac of the Woburn. The gain of the Berkshire was fifty-seven pounds; that of the Woburn was one hundred and seven pounds in the same time. This experiment was so decisive that Wm. Barclay purchased some of the Woburn stock, and after having had further proof, admits their superiority.

Another experiment made by Mr. Fanning, of the Tenn. Agriculturist, and myself, in which half-blooded Woburns were fed against black Berkshires, my pigs gained an average of 20 lbs. more in 61 days than his did in 120 days; the father of these pigs was a *white* Berkshire boar that I imported from England.

Though many of the advocates of the Berkshires admit the Woburns will gain flesh the fastest, they contend that the Woburns are the greatest consumers. For the purpose of testing this matter, we shall shortly have some of each stock fed by some disinterested person by measure. Before my proposition to feed by measure was accepted, I made the following experiment:—I put up a sow (Marion) of the Woburn stock that was eleven months old, very much reduced by suckling pigs, on the fifteenth day of June, and had her fed on five pounds of corn a day, and in ten days her gain was twenty-seven pounds. No doubt a part of this gain was filling up; but it was very apparent that she had fattened. The next nine days she was so much indisposed that she only eat thirty

pounds of corn, and weighed the same she had done before, having neither gained nor lost. At the commencement of the next nine days she was still so unwell as not to eat her allowance, and eat only forty pounds of corn, and her increase was twelve pounds. Under very unfavorable circumstances, Marion gave an increase of 39 lbs. in 28 days upon 120 lbs. of corn. She was in a close pen and had during the time nothing else but water, and some salt with ashes mixed with it.

Now let us see how this will compare with Berkshires. On page 67 of the present volume of the Cultivator, in Letters from the West, A. B. A. says, "I had twenty-two Berkshire swine in a small parture during the month of August, where the herbage was so completely dried up as to give them no feed from it. I accordingly ordered them four bushels of corn per day, but this did not seem to satisfy them, and they were roving about the pasture uneasy, and I soon found losing flesh." Here is twenty-two Berkshire sows (for he tells us afterwards that they were sows) losing flesh upon four bushels of corn, which at 55 lbs. to the bushel, is exactly ten pounds each.

To the inquiry how would they cross with the Berkshires, I would answer, that the Woburns cross well with all hogs that I have tried them with; with the Berkshires there is size and earlier maturity added by the Woburn, and beauty of a shorter, sleeker coat of hair, by the Berkshire.

SAMUEL D. MARTIN.

Colbyville, Ky., July, 1841.

GROWTH OF PLANTS WITHOUT MOULD.

"Some account of a suspended plant of *Ficus Australis*, which was grown for eight months without earth in the stove of the Botanic Garden at Edinburgh. By Mr. William Macnab, Superintendent of the garden." (From the 3d volume of the Edinburgh Philosophical Journal, p. 77. Slightly abridged.

"*Ficus Australis* is a native of New South Wales, and was introduced into the British gardens in 1789, by the Right Honorable Sir Joseph Banks. The plant is not uncommon now in collections in this country, where it has been usually treated as a greenhouse plant; and in a good greenhouse it thrives tolerably well, although it seems rather impatient of cold than many of the plants from the same country.

"When I came to superintend this garden in 1810, I found a specimen of it among the greenhouse plants, where it remained for some time afterwards; but owing to the bad construction of the greenhouse here, and the very hardy way in which I was obliged to treat the plants in that department, I did not find the *ficus* thrive

so well as I had been accustomed to see it do. I concluded that it required more heat, and in the spring of 1811 I placed it in the stove, when it soon began to grow as vigorously as I had ever seen it do.

"The stem of the plant was about a foot in height before any branches set out; on one of the branches, above two feet from the junction with the stem, a root was put out. As soon as this had grown about a foot long, I placed a pot under it. As soon as I found this pot filled with roots, I determined to try whether if supplied plentifully with water it would support the whole plant.

"In August, 1816, I left off watering the original large pot, and supplied the small one very freely with water; I kept it in this state for about eight months, till the earth in the large pot was so completely dry, that I was satisfied the plant could receive no nourishment from it. The shrub continued quite as healthy and vigorous as when supplied with water at the original root. In the spring of 1817, I took off the large pot in which the original roots were, and exposed to the full rays of the sun, by gradually shaking off the dry earth from among them; this had no ill effect on the plant, as it still remained perfectly healthy; it, however, had the effect of making roots be put out freely all over the plant, much more so than had hitherto been the case.

"In the latter end of the summer of 1817, I placed a root in a third pot, which was put out from a branch about three feet from the junction with the stem, and on the opposite side of the plant from that which had supported it for some time past. As soon as I found this pot filled with fibres, I supplied it freely with water, and kept the other small pot dry, as I had done before with the original root. I found the plant still continue equally as vigorous as before. In the spring of 1818, I took away the second pot, which I had for some time kept dry, and exposed the roots gradually, as I had formerly done with those in the original pot.

"The third pot, which now alone supported the plant, was four feet from the lower end of the stem, and very near to the extremity of the branch, the original roots, and the second set of roots, both hanging loose in the air. The plant, however, remained in this state for nearly a year in perfect health. In May, 1819, I took a very small pot, about two inches in diameter, and filled it with earth as I had done the others, and set it on the surface of the earth in the third pot which now supported the plant. Into this small pot I introduced a root which came from the same branch, a little below the one which was in the larger (third) pot. As soon as the small pot was filled with roots, I supplied it freely with water, and gave the larger pot none but what might happen to run through the small one. After remaining in this state for near two months, I cut the branch off between the two pots: I still supplied the small pot only with water, but occasionally at this time threw a little water

over the whole plant. It continued to look as well as it had done before.

"In July last, 1819, I examined the small pot (the fourth used) and found it completely filled with roots, very little earth remaining in the pot. By this time the plant appeared to me to be very tenacious of life, and I determined to try whether it would live wholly *without earth*. I accordingly took the small (fourth) pot off, and gradually worked off what little earth remained among the roots. I at this time, however, threw plenty of water over the leaves, generally twice in the day: this was done about the latter end of July, when the weather was very warm, but it seemed to have no bad effects on the *Ficus*.

"What may appear rather remarkable is, that though this *Ficus* is a plant by no means free in producing fruit in the usual way of cultivating it, this specimen, quite suspended without a particle of earth, was loaded with figs during the months of September, October, and part of November. Two fruit were produced at the axilla of almost every leaf, and these were quite as large as I had ever seen on the plant in the hot houses of Kew Garden. The plant is beginning to grow or extend, although it has now been suspended for eight months without a particle of earth, and during that time we have had very hot weather, and also very cold weather. Roots have been put out very freely all over the stem and branches during that time. The plant now (February, 1819,) measures $7\frac{1}{2}$ feet between the extremity of the root and the top of the branches, and the stem at the thickest part is $5\frac{1}{2}$ inches in circumference."

[*Webster's Appendix to Liebig's Organic Chemistry.*

LEACHED ASHES AS A MANURE.

Leached or drawn ashes possess a highly beneficial effect, particularly when applied to lands deficient in calcareous matters, as lime or marl. They serve to improve the permanent texture of such soil. The ashes from the soap boilers of London yield 90 parts in 100 of calcareous matter. They serve to free light lands of sorrel, and in swampy lands they effectually destroyed rushes and other aquatic weeds. They are extensively used on the light sands upon the Atlantic coast, and are bought up at a shilling a bushel, in the towns and cities upon our navigable waters, and transported thither. There are immense quantities of these ashes in the interior, on the sites of old asheries, which may be employed to great advantage to agriculture, whenever the agriculturists of frontier districts find time and disposition to arrest the deterioration of their lands. The small quantity of alkaline salt and gypsum which they contain, also renders them much superior to common calcareous matter as a top dressing for every kind of grass. Soap

boilers' ashes, according to the "Complete Grazier," are also excellent on a peat moss, in strong cold soils, when applied in the quantity of two or three cart loads per acre. In Lancashire, they have been found good and durable on dry pastures, and have also been successfully used in other parts, and in various proportions. They are generally considered better for pasture than arable, and crops of clover hay have been more than doubled by them. The effect of this manure is, that *it always destroys bugs and vermin of every kind.* Evidence of these latter facts may be found in communications to the British Board of Agriculture, vol. vi. part ii.

[*Cultivator.*

THE VALUE OF ASHES.

Professor Jackson, in one of his lectures in Boston, in illustrating the manner in which soils might be rendered fertile, says that "a farm within his knowledge, which was a blowing sand, a pine barren, and almost hopeless, on which ten bushels of corn to the acre could scarcely be grown, by the judicious application of ashes, had been made to produce forty or fifty bushels to the acre." We do not question the correctness of Dr. Jackson's statements. Our observation has convinced us that on sandy soils, with the exception of clay marl, there is nothing more beneficial in the application to such soils, than ashes; and very fortunately, unless uncommon quantities of acid exist in such soils, leached ashes are nearly as beneficial as unleached ones. Ashes do what lime cannot: they render the soil more tenacious of moisture, and although their action is not as prompt or efficient on our cold soils, they are, for the reason assigned, considered as valuable on light sandy ones. Of this fact the farmers on the light soils of Long Island and New-Jersey are well aware, and in the gathering and application of ashes, find a certain source of profit. [*Ibid.*

For the Southern Agriculturist.

CULTURE OF THE SWEET POTATO.

To the Editor of the Southern Agriculturist:

Dear Sir,—It is the rule of the Beaufort Agricultural Society, to appoint at each meeting, a subject for conversation and discussion at the subsequent one—and the "best mode of planting, cultivating, digging in, and preserving the Sweet Potato, having been under consideration at the meeting held on the 21st August, the following may be set down as the results of their consultation.

It was the opinion of a majority of the members present, derived from actual experiment, that the Sweet Potato should be planted *whole*, instead of the seed Potatoes being cut, as is commonly done in this section of country—that, besides yielding as much when planted whole, this method has the advantage of giving a certain stand, more vigorous growth, and earlier vines. It was further the opinion of one experienced member, that Potatoes planted whole and covered deep—say five inches—would grow well, and be secure against crows; he pursued this plan, and put out no field minders.

The best method of *preparing the soil*, was by passing a cow-pen over the land, six months or more, before the time of planting. The ground was to be listed soon after the pens were removed—to be banked heavily when planted, and the seed inserted deep—say four or five inches in the bank. Early in March was the time decided on by the majority, as the most suitable for planting—and it was held judicious culture, to shave off the tops of the beds by a sharp hoe, as soon as the early shoots were making their appearance.

With respect to the important subject of *preservation*, there were advocates for each of the plans usually resorted to, but the majority were in favor of the bank in preference to the Potato cellar. It appeared, however, that with care, the Potatoes might be perfectly well preserved in either mode. If, in banks, not more than thirty bushels were to be put into each bank, they were to be covered with corn-stalks in preference to pine-trash, and a stake was to be placed in the centre of the bank, which being withdrawn after some days, left an opening for ventilation. The orifice was to be stopped in wet or severe weather to exclude rain or frost. If the Potato cellar was adopted, it was material that the puncheons of which it was built should not be wet, or unseasoned—that the house should not be filled to the ridge pole—that air-holes should be left in the roof to let off the moisture exuding from the Potato, and that a portion of the front part of the

structure should be partitioned off, as a place for the watchman, and the smoke from whose fire would thus be carried by the wind throughout the cellar, and exert an important influence in preserving the Potato. The air-holes to be stopped in heavy rains, or severe frost. The fittest time for digging in the Potato was after the first white frost—and it was thought best, where banks were used, to leave the banks uncovered by earth for some days, protected by corn-stalks merely, from the weather, until some of the superabundant moisture should escape. It was thought that the use of the plough in gathering, and the wagon in transporting the Potatoes, would be injurious to increasing the chance of being bruised, and the liability to decay.

Respectfully, &c.

W. E.

Beaufort, Sept. 10th, 1841.

For the Southern Agriculturist.

ELECTION OF OFFICERS OF ST. ANDREW'S AGRICULTURAL SOCIETY, JAMES ISLAND.

AT the 17th Anniversary Meeting of the St. Andrew's Agricultural Society, held at their Agricultural House, James Island, 6th July last, the following officers were elected to serve one year:

WINBORN LAWTON, *President.*
Dr. ÆNEAS M. MIKELL, *Recording Secretary & Treasurer.*
RAWLINS RIVERS, *Corresponding Secretary.*
WM. S. GODBER, and WM. M. LAWTON, *Stewards.*

The Society was attended by a delegation from the South-Carolina Agricultural Society, consisting of R. W. ROPER, HARLESTON READ, jr., and THOS. CORBETT, Esqrs.

HORTICULTURE.

AN OUTLINE OF THE FIRST PRINCIPLES OF HORTICULTURE;

BY JOHN LINDLEY, F. R. S. &C.

[Continued from page 421.]

V.—LEAVES.

126. Leaves are expansions of bark, traversed by veins.

127. The veins consist of spiral vessels enclosed in woody fibre; they originate in the medullary sheath and liber; and they are connected by loose Parenchyma (7.) which is full of cavities containing air.

128. This parenchyma consists of two layers, of which the upper is composed of cellules perpendicular to the cuticle, and the lower of cellules parallel with the cuticle.

129. These cellules are arranged so as to leave numerous open passages among them for the circulation of air in the inside of a leaf. Parenchyma of this nature is called *cavernous*.

130. Cuticle is formed of one or more layers of depressed cellular tissue, which is generally hardened, and always dry and filled with air.

131. Between many of the cells of the cuticle are placed apertures called *stomata*, which have the power of opening and closing as circumstances may require.

132. It is by means of this apparatus that leaves elaborate the sap which they absorb from the alburnum, converting it into the secretions peculiar to the species.

133. Their cavernous structure (129.) enables them to expose the greatest possible surface of their parenchyma to the action of the atmosphere.

134. Their cuticle is a non-conducting skin, which protects them from great variations in temperature, and through which gaseous matter will pass readily.

135. Their stomata are pores that are chiefly intended to facilitate evaporation; for which they are well adapted by a power they possess of opening or closing as circumstances may require.

136. They are also intended for facilitating the rapid emission of air, when it is necessary that such a function should be performed.

137. The functions of stomata being of such vital importance, it is always advisable to examine them microscopically in cases where doubts are entertained of the state of the atmosphere which a particular species may require.

138. Leaves growing in air are covered with a cuticle.

139. Leaves growing under water have no cuticle.

140. All the secretions of plants being formed in the leaves, or at least the greater part, it follows that secretions cannot take place if leaves are detroyed.

141. And as this secreting property depends upon specific vital powers connected with the decomposition of carbonic acid, and called into action only when the leaves are freely exposed to light and air (279.), it also follows that the quantity of secretion will be in direct proportion to the quantity of leaves, and to their free exposure to light and air.

142. The usual position of leaves is spiral, at regularly increasing or diminishing distances; they are then said to be alternate.

143. But if the space, or the axis, that seperates two leaves, is reduced to nothing at alternate intervals, they become opposite.

144. And if the spaces that seperate several leaves be reduced to nothing, they become verticillate.

145. Opposite and verticillate leaves, therefore differ from alternate leaves only in the spaces that seperate them being reduced to nothing.

VI.—FLOWERS.

146. Flowers consist of two principal parts, viz.—*Floral Envelopes* (149.) and *Sexes* (VII.).

147. Of these, the former constitute what is popularly considered the flower; although the latter are the only parts that are absolutely essential to it.

148. However different they may be in appearance from leaves, they are all formed of those organs in a more or less modified state; and altered in a greater or less degree by mutual adhesion.

149. The Floral Envelopes consist of two or more whorls of transformed leaves; of which part is calyx, its leaves being called sepals, and part corolla, its leaves being called petals.

150. The Sexes are also transformed leaves. (187.)

151. The calyx is always the outermost, the corolla is always the innermost whorls; and if there is but one floral envelope, that one is calyx.

152. Usually the calyx is green, and the corolla coloured and more highly developed; but the reverse is frequently the case, as in Fuchsia, Ribes sanguineum, &c.

153. A Flower being, then, an axis surrounded by leaves, it is in reality a stunted branch; that is, one the growth of which is checked, and its power of elongation destroyed.

154. That Flowers are stunted branches is proved, *firstly*, by all their parts, especially the most external, occasionally reverting to the state of ordinary leaves; *secondly*, by their parts being often transformed into each other; and, *thirdly*, by the whorls of flower-buds being dislocated and actually converted into branches whenever any thing occurs to stimulate them excessively.

155. Their most essential distinctive character consists in the buds at the axillæ of their leaves being usually dormant, while those in the axillæ of ordinary leaves are usually active.

156. For this reason while Leaf-buds can be used for the purpose of propagation, flower-buds cannot usually be so employed.

157. Being stunted branches, their position on the stem is the same as that of developed branches.

158. And as there is in all plants a very great difference in the developement of leaf-buds, some growing readily into branches, others only unfolding their leaves without elongating, and many remaining altogether dormant, it follows that flower-buds may form upon plants of whatever age and in whatever state.

159. But to produce a general formation of flower-buds it is necessary that there should be some general predisposing constitutional cause independent of accidental circumstances.

160. This predisposing cause is the accumulation of sap and of secreted matter.

161. Therefore whatever tends to retard the free flow of sap, and causes it to accumulate, will cause the production of flower-buds, or fertility.

162. And on the other hand, whatever tends to produce excessive vigour causes the dispersion of sap, or prevents its elaboration and causes sterility.

163. Transplantation with a partial destruction of roots, age, or high temperature accompanied by a dry atmosphere, training obliquely or in an inverted direction, a constant destruction of the extremities of young growing branches, will all cause an accumulation of sap, and secretions; and consequently all such circumstances are favourable to the production of flower-buds.

164. But a richly manured soil, high temperature, with great atmospheric humidity, or an uninterrupted flow of sap, are all causes of excessive vigour, and are consequently unfavourable to the production of flower-buds.

165. There is a tendency in many flowers to enlarge, to alter their colours, or to change their appearance by a transformation and multiplication of their parts, whenever they have been raised from seeds for several generations, or domesticated.

166. The causes of this tendency are probably various, but being entirely unknown, no certain rules for the production of varieties in flowers can be laid down, except by the aid of hybridising. (210.)

167. It oftens happens that a single branch produces flowers different from those produced on other branches. This is technically called a *sport*.

168. As every bud on that branch has the same specific vital principle (113.), a bud taken from such a branch will produce an individual, the whole of whose branches will retain the character of the sport.

169. Consequently, by buds an accidental variety may be made permanent, if the plant that sports be of a firm woody nature. (98.)

170. As flowers feed upon the prepared sap in their vicinity, the greater the abundance of this prepared food, the more perfect will be their developement.

171. Or the fewer the flowers on a given branch the more food they will severally have to nourish them, and the more perfect will they be.

172. The beauty of flowers will therefore be increased either by an abundant supply of food, or by a diminution of their numbers (thinning), or by both. The business of the pruner is to cause these by his operations.

173. The beauty of flowers depends upon their free exposure to light and air, because it consists in the richness of their colours, and their colours are only formed by the action of those two agents. (281.)

174. Hence Flowers produced in dark or shady confined situations are either imperfect, or destitute of their habitual size and beauty.

175. Double Flowers are those in which the stamens are transformed into petals; or in which the latter, or the sepals, are multiplied. They should not be confounded with *Proliferous* (183.), and *Discoid Compound Flowers*. (184.)

176. Although no certain rules for the production of double Flowers can be laid down, yet it is probable that those Flowers have the greatest tendency to become double, in which the sexes are habitually multiplied.

177. In Icosandrous and Polyandrous plants either the stamens or the pistilla are always very numerous when the Flowers are in a natural state; and it is chiefly in such plants that double Flowers occur, when they become transformed.

178. It is therefore in such plants that double Flowers are to be principally expected.

179. In proportion as the sexes of Flowers habitually become few in number, do the instances of double Flowers become rare.

180. Double Flowers are therefore least to be expected in Plants with fewest stamens.

181. Whenever the component parts of a Flower adhere by their edges, as in monophyllous calyxes, monopetalous corollas, and monodelphous, or di-, or poly-adelphous stamens, the tendency to an unnatural multiplication of parts seems checked.

182. Therefore in such cases double Flowers are little to be expected; they are, in fact, very rare.

183. Proliferous Flowers are those in which parts that usually have all their axillary buds dormant, accidently develope such buds; as in the Hen and Chickens Daisy, in which the bracteæ of the involucrum form other Daisy-heads in their axillæ; or, as in

certain Roses, in which the carpillary leaves develope leaf-buds in their axillæ, so that the flower becomes a branch, the lower leaves of which are coloured and transformed, and the upper green, and in their ordinary state.

184. Discoid compound Flowers are those in which the central florets of a flower-head acquire corollas, like those of the circumference, as in the Dahlia; the cultivated varieties of which shonld be called discoid, and not double.

185. These two last are so essentially different from double flowers, that whatever laws may be supposed to govern the production or amelioration of double Flowers, can have no relation to proliferous or discoid compound Flowers.

(To be continued.)

VEGETABLE GARDEN.

PARSLEY—(*Apium Petrosilinum.*)

VARIETIES:

Single or Common,	Hardy Siberian,
Dwarf Curled,	Large Rooted Hamburg,
Extra Curled,	Large Rooted Naples.

From the term *apium* being given to the parsley, it will be observed that it is classed with the celery. The specific name is derived from its supposed medicinal qualities.

The garden parsley with curled leaves is a native of Sardinia, bordering on the coast of Italy. It was not cultivated in England until the year 1548. It is a most useful and pleasant vegetable, and was formerly considered of service in dropsies and various other complaints, but is now seldom used for this purpose, except in Holland, where the large rooted sorts are in much esteem.

Parsley is in considerable demand for culinary purposes, and forms a common and beautiful garnish to most cold meats. It should always be brought to table when any dish is introduced strongly seasoned with onions, as it both takes off the smell, and prevents the after-taste of that strong root. It is a well-known seasoning herb, and communicates an agreeable flavour to soups and stews.

The following recipe may be of use to preserve parsley for the seasoning of meats, &c., when five shillings are asked for a very small quantity, and which is often the case in very severe seasons.

To preservc parsley for the above purpose, let it be gathered on a dry day, and immediately put into a tinned roasting screen, and placed close to a large fire, where it will soon become brittle; it may then be rubbed fine, and put into glass bottles for use.

Culture.—Parsley being so very valuable an article in the garden, and especially the curled sort, much care is necessary to keep it true. This can only be done by rouging, an appellation given by seed growers, who value their stock and character; and to their credit their warranted stock may be relied on.

Parsley is generally sown in drills round the borders of the kitchen-garden. It is a singular vegetable in respect of the long time it takes before vegetating: hence the seed should be sown early in spring, as it remains six weeks in the earth before the plants appear; they never vegetate in less than forty days, though they do not often exceed fifty. Thus it takes longer to vegetate than any other garden seed; but it may be observed that old seed comes up earlier than new.

When it has apparently arrived at its full growth, it should be cut down; but only a third part of what is sown at a time, by which means a young stock will be continually kept up for use; and should any of the plain leaved happen to be mixed with the curled, they should be rooted out. These cuttings or gatherings will enable the plants to resist the severe weather much better than when left to remain from a summer's growth.

It was many years after the introduction of the common or garden parsley into this country, that the large-rooted, or Hamburg parsley, was introduced from Holland, in which country large quantities are used in their favourite dish, "water souche," being boiled with what are called Dutch plaice or flounders.

The seed of this variety is best sown thin, broad-cast, in a bed four feet wide. An ounce of seed will produce sufficient for a moderate family.

The seed should be sown on a well prepared piece of ground in the beginning of March; and when the plants are of a proper size, they must be thinned out with the hoe, and managed afterwards similarly to carrots and parsnips: such as, taking them up in the autumn (when they will be found of a large size); clearing them of their decayed tops within an inch or two of the crown, and laying them under cover in sand or light dry earth, where they will be ready for use.

To procure fresh green parsley throughout the winter, let a rich, light, and warm spot of ground be chosen, on which, after being properly dug and levelled, mark out a bed four feet wide (which will take a frame, &c. hereafter, if there be one to spare): the length to be fixed by what is likely to be wanted; for a private family, fifteen to twenty feet will produce a good and sufficient supply. On that bed let seed of the best curled parsley be sown rather thin (not in drills), towards the end of May. The seed should be raked in and lightly beaten down with the back of the spade, and some fresh earth thinly strewn over the whole. Should the weather be very dry, a light watering must be given to the bed,

and continued at times, if necessary. When the plants are of sufficient growth to admit of the hoe, let them be thinned out to full two inches in breadth; after this hoeing the plants will gain strength and keep growing, more or less, throughout the winter, by being protected, first by frames, as already mentioned, or by mats; the bed being previously arched over with hoops, and the covering regulated by the weather, which in some seasons may require an extra covering of fern or litter; for as it is the nature of the common parsley to keep growing (when not checked by frost) the whole year, its protection is an object of paramount importance. [*The Vegetable Cultivator.*

PARSNIP—(*Pastinaca Sativa.*)

The botanic name, *Pastinaca*, was given to this root from its nourishing and other good qualities.

The parsnip is a native of England; but improved by cultivation. It is a biennial, as most tap-rooted vegetable plants are; and though indigenous in England, it has been found in a natural state in other countries of the south of Europe.

Parsnips contain a very considerable portion of sugar, and are more nourishing than carrots or turnips.

Marmalade, made with parsnips and a small quantity of sugar, excites appetite; and is said to be a very proper food for convalescents.

Wine made from these roots approaches nearer to the malmsey of Madeira and the Canaries than any other. It is made with little expense or trouble, and only requires a few years to make it as agreeable to the palate as it is wholesome to the body.

Parsnips, exclusive of their well-known use with salt fish and salted meats, form what may be called an elegant side dish at table; when, after being boiled (not too soft), they are dipped in thin batter of flour and butter or the white of eggs, and afterwards fried brown; such a dish has been highly approved of at the first tables. Both the French and Dutch cooks make a very agreeable soup of them.

The Parsnip is a profitable and desirable root for a family in winter and spring, being wholesome and nourishing, and it should be cultivated abundantly in every kitchen-garden, not only for domestic use, but as a profitable esculent to the market-gardener and cottager. The latter will find it not only a useful vegetable for his family, but will also be a considerable gainer should he cultivate it partially with a view to profit. It has long been found excellent for the purposes above mentioned from October till May.

Such then, is the Parsnip, as a horticultural vegetable; for an agricultural purpose it has first rate properties. Cows fed freely

on parsnip roots, will yield an abundance of milk of a rich quality. In Germany parsnips are sown for this express purpose; and sheep, when lambing, if fed with them, will produce much milk, to the benefit of the lambs.

The varieties of the parsnip are but few.—

1. Common, or Swelling Parsnip, is of ancient date, and good; but it is now superseded by the following:

2. Guernsey Parsnip, an improved variety of the common, and in much esteem.

3. Hollow Crown, or Headed, is of late introduction. It grows to a large size, and merits cultivation, being very hardy; it is tender in its flesh, and of an agreeable flavour. The author, however, has found but little difference between the taste of this and the other varieties when grown in the same soil. It is owing to the deep rich soil of Guernsey that the Parsnips from that island are so much extolled.

Culture.—The Parsnip requires a good rich soil that has been trenched full twenty inches deep; and if it has been manured the year before, so much the better. In the course of trenching, care should be taken (as advised for carrots) that the earth be well broken, and that neither lumps nor stones are left to arrest the progress of the roots in striking downwards (this must be done a few days before it is wanted, in order that it may become settled): after it is levelled, the first fair day early in March, the seed must be sown, either broad-cast or in shallow drills. The broad-cast sowing depends on the space of ground sown, which, if light, may be lightly trod, and afterwards raked or harrowed, in order to cover the seeds equally and to smooth the surface; but in small gardens, drills are the most eligible. In neither case should the seed be sown too thick, as the plants will require to be finally left from eight to twelve inches apart; much, however, depends on the nature of the ground. If the seed is sown in drills, these should be drawn shallow, full a foot apart, and the plants thinned in the rows to nearly that distance. In about three weeks the seeds begin to germinate; and when the plants are about two or three inches high, they will require the first thinning with a four-inch hoe, cutting up, at the same time, all weeds that may have arisen. Their second hoeing should be within a month afterwards, when they must be finally thinned out to the regular distance above mentioned; and should the ground be remarkably good, a greater distance will be required. After the second hoeing and thinning, the plants may probably require another weeding, till they are in full leaf, when they cover the ground, and bid defiance to any further interruption from weeds.

In the autumn—about October or November—the roots will have nearly attained their full growth. When the leaves begin to turn yellow and decay, which is a certain sign of their maturity,

they may be dug up for use, as they are wanted. Parsnips are not liable, like carrots, to be injured by severe weather.

In taking up Parsnips, the greater their length, the better they keep; hence a trench should be opened of sufficient depth for a proper hold to be taken to pull them up, which is better than cutting them off with the spade. [*Ibid.*

PEPPER—(*Capsicum.*)

VARIETIES.

Grossum, or Bell Pepper, | Long Red, or Bird's Bill,
Tomato shaped, or Squash, | Cherry, or West Indian,
Sweet Spanish; used as a Salad, has a very delicate taste.

This family of plants are natives of the East and West Indies; some of their capsules, or pods, are yellow, and others red, when at maturity; they are much used for pickling, and should be gathered for that purpose before they are fully ripe.

The seeds of the different kinds of *Capsicums* may be sown in a hot-bed in February, or on a warm border, in March. One ounce of seed will produce about three thousand plants. When the plants arrive at the height of from one to two inches, they should be transplanted into good rich ground, from eighteen inches to two feet distant from each other.

Those who do not want Peppers early in the season, may sow some seed in the open ground in April, in drills two feet asunder, and half an inch deep. When the plants are grown an inch or two high, thin them to the distance of fifteen or eighteen inches in the rows. The ground should be afterwards hoed deep around the plants, and kept free from weeds by repeated hoeings.

The *Capsicum Grossum*, or Bell Pepper, is perennial, and will keep in perpetual bearing in warm climates. In England this species is considered superior to all others, on account of its skin being thick, and also pulpy and tender; the plants are therefore frequently preserved in hot-houses during the winter and spring, and kept in the open air in settled warm weather.

[*The Young Gardener's Assistant.*

NITRATE OF SODA.

From the importance of manure as an auxilliary to gardening, I am induced to send the results of some experiments I have made with nitrate of soda, which, though partaking more of an agricultural than a horticultural nature, may yet be interesting to some of your readers. In March last I sowed a piece of ground with Barley which had previously been Swede Turnips and eaten off by sheep, and the ground, by being manured with them, would undoubtedly

have produced a fair crop without the nitrate of soda, which after ploughing, I sowed in the proportion of one cwt. per acre, and harrowed in together with the seed, and about a month afterwards Red Clover was sown and the ground rolled. As I naturally expected a good crop, I was not disappointed, as I think it would be impossible for a heavier crop to stand on any ground; and if the late untoward weather had not beaten it down, and consequently wasted a great portion of it, I would have endeavoured to calculate the quantity per acre. At present it presents rather a disorderly appearance, it being ripe, and the Clover nearly as high as the Corn. The singular luxuriance of the Clover I attribute to the nitrate. I also find by some experiments on Grass lands, that a decided improvement was manifest wherever it had been applied, and as I sowed it in detached places in a meadow field, such spots were easily recognised when the grass was cut. A friend of mine had sown half a field in grass in a similar way, only as it was in ridges he sowed each alternate one: the appearance in June was perceptible half a mile off; the deep verdant hue of the dressed ridge as compared with its fellow made it look something like corduroy. He has extensively used it these three years, and repudiates the idea of its being a mere stimulant, as he finds his Grass growing every year since with undiminished luxuriance. I must admit that I, as well as others, was doubtful of its efficacy, until upon trial I found out my error; I am therefore wishful to recommend it to the notice of all persons desirous of improving their Grass lands. One trial will, I think, convince them that there is no interested quackery in puffing up nitrate of soda, as is sometimes supposed, and that bulky manures are not the only means of rendering poor and worn-out pasture lands verdant and productive. I think Grass land, or any thing requiring a lengthened degree of luxuriance, is more benefited by it than grain or tubers, requiring some time to mature themselves. I found that by dressing a bed of Onions with it in April, a visible improvement took place in the foliage; but I am sorry to add, that the greenness of the foliage still continues, while the bulbs have made but little progress, although the others on the adjoining beds have ripened theirs. From other experiments, I have arrived at the conclusion that where a great and rapid growth is wanted, as with Lettuce, Celery, the whole Cabbage tribe, &c., nitrate of soda may be advantageously used; but it should be entirely withheld where too much grossness is unnecessary, as in Peas, Beans, and Potatoes, which, by its application, run all to haulm. Not having tried it upon fruit-trees or flowers, I am unable to say what its effects may be there.

S. N. V.

[*Eng. Gardener's Chronicle.*

CHEAP AND VALUABLE MANURE.

Raise a platform of earth, eight feet wide, one foot high, and of any length, according to the quantity wanted on the headland of a field. On the first stratum of earth lay a thin stratum of lime fresh from the kiln, dissolve or slake this with salt brine or sea water, from the nose of a watering pot; add immediately another layer of earth, then lime and brine as before, carrying it to any convenient height. In a week it should be turned over, carefully broken and mixed, so that the mass may be thoroughly incorporated. This compost doubles the crop of Potatoes and Cabbages, and is actually better than stable-dung. [*Eng. Globe.*

THE FLOWER GARDEN.

MONOGRAPHY OF THE GENUS CAMELLIA, OR AN ESSAY ON ITS CULTURE, DESCRIPTION AND CLASSIFICATION;

BY THE ABBE BERLESE.

Translated from the French for the Horticultural Register, by Henry S. Dearborn.

[Continued from page 440.]

Sec. 12.—PRUNING OF THE CAMELLIA.

There are but few exotic plants, which bear pruning, as well as the Camellia; and by performing this operation with intelligence and at the proper time, it assumes the form, which it may be desired to give it, and blossoms most abundantly. The periods for pruning are, either the spring, immediately after the florescence, or in the summer, after the second growth; that is, about the middle of August. If the pruning is performed in the spring, it is necssary, immediately after that delicate operation, to carefully repot the shrub, place it in a green-house, where there is a considerable elevation of temperature, to induce it to throw out its new branches vigorously and in season to get well ripened before the cold weather commences. If the plants are pruned in August, it becomes requisite to sacrifice the existing buds, and a year is lost, before the blossoms can be enjoyed; for at this epoch the vegetation of the Camellia, is disposed to repose; but the after growth in the spring, which succeeds the pruning, will be much more vigorous, and the new branches with which the plant is supplied, will begin to bear buds the second year.

Besides, the Camellias which are pruned in August, may remain in the open air until the common period, when all the plants are returned to the green-house; but those which are pruned in the spring, require to be put in a glazed hot bed, immediately after that operation, as has been before said; for without this precaution, they vegetate but slowly, and produce only small and feeble shoots, which do not blossom for several years.

SEC. 13.—THE MULTIPLICATION OF THE CAMELLIA.

The Camellia is multiplied in three manners: by the seeds, cuttings, or layers and grafts.

By seeds.—The seeds are planted, in a hot bed, under glass, in a peat soil, which has been passed through a sieve. The seeds which are sown, should have naturally arrived at maturity, which is easily known, by their falling spontaneously from their hard pericarps. The bed should be lightly covered with moss, to keep up, continually, a slight humidity. The seeds often remain two years before they vegetate, but sometimes the young plants appear the first year. As soon as the plants have attained about two inches in height, they are to be taken up, with a small ball of earth attached to each, and put into separate little pots, which are to be arranged in the same hot-bed, and protected from the air and sun, until they are in a state to bear exposure, when they are to be managed in the manner as has been recommended for Camellias generally. At the expiration of five or six years, nearly all of these individuals, are in a flowering state; some of them, however, do not blossom for twelve years, as we have experienced. Seeds of the Camellia which were gathered in 1819, from the celebrated tree at Caserta, did not bloom until 1831, and we have two plants, which were produced from those seeds, that flowered for the first time in 1836, which was more than fifteen years after they were planted.

To induce Camellias obtained from the seed, to bloom promptly, they must be grafted as soon as the wood is sufficiently matured, which is in their second or third year. This should be done only on the most vigorous plants, to render the florescence more certain and rapid.

By cuttings.—This method is employed to obtain free stalks, but more often to procure subjects for grafting; and the *single red* or *pink* are usually selected for this purpose.

The following is the most simple manner of performing the operation.

In the spring, the shoots, of the preceeding year's growth, are selected, from the single, or semi-double Camellias, which are divided into cuttings, from four to six inches in length; these are set out together a few lines distant from each other, in pots filled with peat soil, which are plunged in a pit of tanner's bark and covered with a

hand glass, or placed in a shaded position of the green-house; from time to time, it is necessary to raise the hand glasses, and wipe off the interior humidity, and occasionally moisten the cuttings, with a little watering pot, made expressly for the purpose. Cuttings thus managed take root, in about six weeks, and when the roots are sufficiently developed, they are transplanted into small pots, where they remain until large enough for being engrafted. The Camellia can thus be multiplied by cuttings, in green-houses, which have no artificial heat, and without the aid of tan; but the process is too long and often uncertain.

The Camellia can also be multiplied by layers; but horticulturists have generally renounced this mode of operation, because the subjects thus treated, take too long a time to root, occupy too much space in the green-house, or hot-beds, besides requiring the sacrifice of the most beautiful branches; and the result is not in proportion to the labor, time and expense, which it occasions; grafting, therefore, is the expedient of multiplication, which every where prevails.

Sec. 14.—DIFFERENT METHODS OF GRAFTING THE CAMELLIA.

Grafting.—The Camellia, which it is desired to multiply, is generally grafted upon stocks of the *single red* variety, or any other single or double kind, may be selected, which can best be spared for that purpose. There are now several modes of grafting; but we shall only describe those which are most generally practised, and especially that, which the Belgians most commonly employ, to propagate the new and most valuable varieties.

Grafting by approach, or Inarching.—The kind of grafting most used, the easiest to perform, as well as the most natural and most ancient, is certainly that called inarching. This mode which can be practised at all seasons, is, nevertheless, most commonly performed in March.

In performing the operation, a lateral cut or slit is made in the stock, so as to form a kind of tongue, or a portion of the bark and sapwood is removed, an inch, or an inch and a half in length, and as low as possible. The same thing is done on the branch of the Camellia, which it is desired to obtain. The parts thus prepared are carefully united,—precaution being taken, that the barks of both exactly coincide, and they are confined with woolen yarn, hemp, or strips of bass-wood bark, which have been first moistened. In a few months the parts are united; but the portion of the branch of the Camellia, which is united to the stock is gradually seperated, by incisions made at intervals, of from eight to ten days, in the following monthly order. Camellias, inarched in March may be seperated in August, and those on which the operation is performed in May, in October; being cautious to commence the incisions a month before.

Cleft Grafting.—This is the common mode of grafting, which every body understands, but which was not practised on the Camellia, until the immense results were made known, which our excellent friend, Mr. De Soulange Bodin obtained, in his grand establishment at Fromont, near Ris. That learned and skilful horticulturist made use of this method, in preference to all others, because, at all seasons, it can be performed, by the aid of the artificial means which is specially used, to excite a flow of sap in the plants, and cause them to vegetate. Mr. Soulange Bodin has substituted this kind of grafting for that of Belgium,—an account of which we shall give hereafter; it offers the same advantages, namely, economy of time and material, and probably more certainty in the results. By the employment of this ingenious method, a small twig of the species, which it is desired to multiply, having on it a single bud, and grafted on a congenial stock, produces in six weeks, a complete shrub.

Mr. Soulange Bodin calls this the *stifled* graft, because the plants, as soon as they are grafted, are put in a very warm bark-pit and covered with a bell-glass, where they have the appearance of being stifled.

Those who say, that this mode of operating, injures the root of the stock, while it is subjected to the very elevated heat of the hot-bed, are completely deceived. We have had, in our possession, many Camellias, which were grafted in this manner several years since, and we have never perceived any disease in them which could have arisen from that cause. We will cite a characteristic fact, in support of this assertion. In January 1830, having made an excursion to Fromont, we selected and brought back, during intensely cold weather, against the advice of the proprietor, and the gardener of that establishment, a dozen little Camellias, which had been grafted according to the above named process, and recently removed from the hot-bed. In spite of all our precautions, we found the earth in the pots entirely congealed on our arrival. Still hoping to save them, notwithstanding this fatal accident, which was solely occasioned by our obstinacy, they were carefully kept, the whole of the winter, in a mild and uniform temperature, and in the spring, we had the pleasure of seeing the whole of our Camellias vegetate vigorously, as if nothing had happened. If the manner in which my friend had treated these young plants, had been pernicious and injured their roots, and especially when the severe cold to which they were subjected was added to that cause, they must inevitably have perished, without the possibility of redemption.

The Belgic Graft.—This is a lateral mode of grafting, to which the Belgians give the preference, and is performed from spring until autumn. This is the method of operation. A portion of the bark and wood is cut from the side of the stock, and as low as possible, in the same manner as for inarching. A small scion of one or

two inches in length, with one bud and a single leaf on it, is taken from the Camellia, intended to be multiplied, the end cut sloping, on one side only, like a wedge and so placed on the stock, as that the barks of both shall coincide, and then secured with woolen yarn.

When this operation is completed, the pot containing the engrafted stock, is placed upon its side upon an unheated bark-pit, or dry moss, on which, however, the branches only should rest; then the grafted part is immediately, hermetically covered, with a bell-glass. At the expiration of fifteen days, the graft is perfectly united, and in three weeks, at the farthest, the plant is ready for sale.

It is superfluous to remark, that this graft, during the whole time that it remains under the bell-glass, to form the desired union, should always have the protection of a green-house, if the operation is performed in the summer, and of a glazed but unheated pit, if at any other season.

Inarching—by a cutting.—Heretofore, in uniting the graft to the stock, it was planted like a cutting, near the root of the stock, and a result was produced, very nearly like that which is obtained by the Belgic graft; but this mode of operating, requiring a branch of a certain length, the same number of plants cannot be obtained from the parent Camellia: but still, this mode, as well as that of the Belgians, is economical and expeditious.

CACTACEOUS PLANTS.

This being the best season for engrafting the different kinds of Epiphyllum and other Cacti, I beg to give an outline of my practice, for any such readers of the *Gardener's Chronicle* as are, like myself, growers and admirers of that most splendid family of plants, but are not acquainted with the simple treatment they require. I grow for stocks, Pereskia aculeata, Cereus hexagonus, and Cereus speciosissimus; I prefer the latter, on account of its hardy, lasting, and robust habit. I grow the stocks freely till they attain the height that I want them. Some I grow with 5 or 6 stems, from 1 to 5 feet; others I grow from 1 to 4 feet; the short stems I engraft at the top with the Epiphyllum speciosum and Ackermannii, the tall single stems with E. truncatum, and some from the surface of the pot to the top, all of which is of course according to individual fancy; E. truncatum should always be engrafted high, without which, from its drooping habit, the greater part of the beauty of the bloom is lost. The grafts that I find to succeed the best, are young-growing shoots, about $1\frac{1}{2}$ or 2 inches long. I pare off the outer skin or bark for about $\frac{1}{2}$ an inch at the base of the graft, and cut what is intended to be inserted into the stock in the shape

of a wedge; I then make an incision in the angles or top of the stock, with a pointed stick made the same shape as the scion. When the grafts are first put in, to prevent their slipping out, I pass through each a small wooden peg or the spine of a thorn; I then cover each with a small piece of moss, and place them in a shady damp house, and syringe them over the tops occasionally in the evening; they will all adhere to the stocks in ten days or a fortnight, and make good plants by winter. By engrafting the showing kinds of Cacti on the stocks that I recommend above, noble specimens can be grown in a few years from 1 to 10 feet high if required, and the size and colour of the blooms are much superior to what they ever produce when grown on their own roots. E. truncatum by the above treatment becomes quite a hardy greenhouse plant, and will bloom three months later than it does when grown in the stove on its own roots in the usual way.

Beautiful as many of the above family are, they are not one in ten worth growing as ornamental plants, unless a Botanical cultivation is the object of the cultivator: that being our object, we confine our collection to the following species and varieties, which are, I believe, the most desirable kinds, viz:—

Epiphyllum speciosum
grandiflorum
rubrum
majus
Ackermannii
majus
grandiflorum
cæruleum
purpureum
Greenii
truncatum
violaceum
Jenkinsonii

Epiphyllum Jenkinsonii majus
minus
coccineum
multiflorum
Cereus Smithianus
variegatus
Mallisonii
superbus
grandiflorus
triangularis
flagelliformis
elegans.

[*Eng. Gardener's Chronicle.*

THE ORCHARD.

ON THE FORMATION OF FRUIT-TREE BORDERS.

A great error pervails in making them too rich and too deep, by which strong rampant unfruitful branches are produced, scarcely ever ripening, and in the pruning season, from an overflow of sap, cutting quite spongy; or when they begin to break, as they are suffering from internal disease, a host of insects attack them, which retards their growth until midsummer, when an effort is again made, and they continue growing with increased luxuriance unti

nipped by the frost. The first consideration in making tree borders should be, to render the subsoil perfectly dry by draining. When it is of a cold clayey nature, it would be well to have the bottom paved with flag stones, with a fall of 18 inches in 12 feet from the wall to the walk, to carry the water off by a drain in front of the border. When flags cannot be procured, a solid bottom may be made, at a trifling expense, with a mixture of lime rubbish, gravel, and coal ashes, watering and rolling until they are well combined. It is necessary to drain, even if the bottrm is not wet, that water from a continuation of rainy weather, or from any other cause, may be speedily removed. The borders for Peaches, Nectarines, and Apricots, he would not make more than 18 inches deep; the soil of a light rich loam of a friable texture, the top spit should only be used as containing the greatest quantity of fibrous manure, avoiding dung, as the greater portion of the diseases of these trees may be traced to gross feeding. When necessary to enrich, add vegetable mould. Some soils will grow fruit-trees well without any preparation whatsover; and others of a middling quality may be improved at little expense by taking out a portion of the old soil to be replaced with new, and both will be incorporated. In wet soils the Apple-tree soon cankers; it will prosper in any good soil, 20 inches deep, on a dry bottom. Pears will bear more moisture, yet a superabundance is equally injurious to them; they will succeed in loam or any good garden soil two feet deep. Cherries and Plums should have a hazel loam of 18 inches deep; they will, however, succeed in any garden soil of middling quality. He makes no border more than two feet deep, as he repeatedly experienced the advantage of keeping the roots near the surface. Even in dry seasons, if nourishment is required, it can always be administered from the top, but if a superabundance of water stagnates around the roots no remedy can be applied without injuring them. It is necessary in the growing season, when an abundance of nourishment is required, that the soil must be moist but not wet, and open in its texture, that heat and air may have free access to the roots. In a wet situation if water is retained, a diseased tree will be the consequence; and in a dry situation, if the water drain away too quickly, the soil will not afford sufficient nourishment for the supply required. If the substratum is too porous, which is seldom the case, adhesive soil may be advantageously placed in the bottom of the border and rolled to an even surface, which will prevent the water from passing of too quickly. The soil to be kept open for the purpose of retaining heat and moisture, as the solar rays act more powerfully in drying the soil upon a hard surface than on a loose one; and the air generated between the particles, being confined, retains the heat. Keeping the soil open is one of the great benefits derived from mixing large stones in fruit-tree borders; they may be placed indiscrimi-

nately within a few inches of the surface, where they retain moisture as the roots cling round them with avidity. Those who have not seen it would be astonished to find how they get enveloped with roots. I may be considered too sanguine on the subject, having alluded, in my essay on draining, to large stones being placed in a vine border; but the success with which it was attended, will I hope, plead my excuse.

Planting.—Fruit-trees may be successfully planted in mild weather, from the fall of the leaf to the rising of the sap, but he would prefer to plant before the leaves have fallen, in the latter end of August or beginning of September, as the sap, elaborated by the leaves, would soon establish the tree by a protrusion of new spongioles; syringing, mulching, watering, and shading when practicable, to be regularly attended to, as the state of the weather may require. On soils that are apt at certain times to be wet he would plant on the surface, forming a mound around each tree, mulching with littery manure after planting and during continuations of dry weather; it is a protection to the roots from frost as well as from dry weather, and prevents the soil from being washed away when water is applied. As surface water is seldom beneficial and frequently injurious, when a tree is suffering from want of water remove the mulching and part of the soil until the fibres of the roots are perceived, when a good supply should be given, covering up with the dry soil, which prevents evaporation and also the surface from crusting. When planting, as soon as the roots are regularly spread out, some fine soil should be worked in amongst them with the hand, allowing it to settle without treading, watering it immediately, and mulching as soon as convenient. The bole of the tree to be planted eight inches from the wall, with the head inclining towards it. When pointing the soil a three-pronged fork to be used in preference to a spade, as mutilation at the roots is always injurious unless when properly done as a check to over-luxuriance. When trees are received from a distance and the roots dry, immerse them several hours in water previously to planting. Fruit-trees two years trained, of clean growth, are to be preferred, if quite free from gum or canker, which indicate constitutional diseases never to be eradicated.

Pruning.—Commence as soon as the wood is properly matured, which will give strength to the fruit buds; when wood is not well ripened defer pruning until the sap is beginning to rise. Whatever system is adopted endeavour to keep a supply of wood in every part of the young tree; a good foundation must be made for future management, taking into consideration the present well-being of the tree. It frequently happens that young trees grow vigorously for years after planting, and show little or no signs of fruitfulness, which proceeds from improper pruning, such as shortening too much, which increases the evil, as also does training too uprightly.

To remedy this he advised to lay the branches in at full or nearly full length, to bend them downwards in half or quarter circles to arrest the sap in its progress, by which fruit buds or bearing laterals will be produced. Young newly planted trees of Apples, Pears, and Plums he would not prune until the rise of the sap, when the young wood is to be loosely nailed in at full length, leaving the buds that are wanted at the lowest part of the branch and displacing all others. When young trees are cut down soon after planting, and, the sap being in a crude indigested state, canker or some other fatal disease and unhealthy wood are produced, the disbudded shoot should be cut out before the fall of the leaf to make room for its successor. If summer pruning be properly attended to, little will be required in autumn. Lay in no more shoots in the summer pruning, unless the tree is very vigorous, than will be absolutety necessary for a supply of bearing wood in every part of the tree. The branches should be tied with matting two inches from the wall, by which a free circulation of air will be promoted, and well ripened short-jointed wood produced. The mode of bearing will regulate the quantity of young wood to be retained, and also the system of pruning. Thus less will be required for Apples, Pears, Cherries, and others that bear their fruit on spurs. More will be required for Peaches, Nectarines, and others that produce their fruit almost entirely on the young wood. Fruit spurs, when practicable, should be retained; which increases the probability of having a crop in unkind seasons. When trees are vigorous, cut but little, and endeavour to produce fruit, which is the best check to over-luxuriance; to prune away quantities of young wood one season is only to encourage more for the next.

On training.—He alluded to the different systems adopted at the Horticultural Gardens, Chiswick, to prove the merits or demerits of each, and believed that Seymour's is nothing more than the fan method brought to a system of regularity in management; the wood being sparingly laid in is well matured. He recommended the fan system for Apricots, Peaches, Cherries, Plums, and some of the more delicate sorts of Pears and Apples. The generality of Pears, Apples, and the coarser Plums require horizontal training to bring as soon as possible their vigorous habit of growth into a fruitful state. Under all systems endeavour to keep the two sides equal. When trees trained horizontally become weak, it will be advantageous to elevate the branches until the wished for vigour is obtained, when they can be replaced in their former position. By elevating the weaker and depressing the stronger branches, a regular system of growth will be established, also allowing some superfluous branches to grow for a time on the weaker side to draw a more abundant supply of sap to that part of the tree. The annual shoots to be left from six inches to four or five feet according to their strength. The leaders of horizontals to be trained at full

length until they have filled their allotted spaces, when they can be treated as other spurs, or shortened back to obtain a fresh leader. From the neglect of fruit-trees during the first, second, and third years of their growth, it frequently happens that it is necessary to root them up and to plant young ones, by which a great loss of time with additional expense is incurred. When trees under good management become diseased, endeavour by examining the borders to trace the source from which it proceeds: gross feeding is the cause of many, and some suffer from starvation. The moisture in the soil, as soon as absorbed into the plant, begins to undergo a change, acting and being acted upon by every other part until it becomes to the tree what blood is to the animal. The disruption of a blood vessel injures and often proves fatal to the animal, so also to the vegetable economy. [*Eng. Gardener's Gazette.*

PEACH WORM.

Messrs. Editors:—Has there been any preventive discovered to the ravages of the peach worm or grub, which threatens to destroy this most delicious of fruits? I have some fine trees which I find have been attacked. I am loth to lose them, and any information you may be able to give, will be thankfully received by one, at least, of your many SUBSCRIBERS.

IF the trees are already infested by the grub, let them be carefully examined around the root, and every worm dissected out of the bark. Complete excision will alone save the tree; at least such is the opinion of some of the most successful peach growers. With this evil prevention is better than cure, and fortunately since attention has been directed to this point, methods have been discovered which appear to be effectual in preventing the attacks of the parent moth or fly. Planting the red cedar in the same hole, and leaving the roots and stems in as near contact as possible, has been found by experience to preserve the peach, the odor of the cedar being offensive to the parent grub, and the slow growth of this shrub preventing any injury to the peach. Prof. Kirkland, of Ohio, says—"Tansy and wormwood contain large quantities of essential oil, which is peculiarly offensive to this insect; and it is found that if the body of the peach tree be surrounded by half a dozen sprouts of either of these vegetables, it will be perfectly secured against the approaches of the destructive enemy. They should be planted in the spring nearly in contact with the body of the tree, and so as to surround it. During the summer they should be cultivated, and kept free from grass. In this way they form a a permanent and successful means of defence against the insect that has nearly exterminated the peach tree from many sections of our country." [*American Farmer.*

HOUSEHOLD AFFAIRS.

TO MAKE TOMATO FIGS.

Take six pounds of sugar to one peck (or 16 lbs.) of the fruit. Scald and remove the skin of the fruit in the usual way. Cook them over a fire, their own juice being sufficient without the addition of water, until the sugar penetrates and they are clarified. They are then taken out, spread on dishes, flattened and dried in the sun. A small quantity of the syrup should be occasionally sprinkled over them whilst drying; after which, pack them down in boxes, treating each layer with powdered sugar. The syrup is afterwards concentrated and bottled for use. They keep well from year to year, and retain surprisingly their flavor, which is nearly that of the best quality of fresh figs. The pear-shaped or single tomatoes answer the purpose best. Ordinary brown sugar may be used, a large portion of which is retained in the syrup.

[*American Farmer.*

BLACKBERRY JAM.

Though a common, wild, and generally despised fruit, the blackberry makes an excellent jam, the use of which is found very serviceable in disorders of the kidneys and bladder, besides being a very agreeable sweetmeat. Put into a stone jar, a quantity of blackberries not ripe, but of full size and of a rich red colour. Cover the jar and place it in a kettle of water. Set this over the fire, and make it boil. Let it so boil during six hours, supplying the water in the kettle lost by evaporation. At the expiration of that time, take it off the fire, put it into a preserving-pan, and to every pint of the mashed fruit, add a pint of water, and two pounds of lump sugar, clarified together as before directed. Set it on the fire, and stir it about until of a proper consistence. Then put it into pots in the usual manner.

STRAWBERRY JAM.

Put the fruit into a jar, and stand this in a pan of boiling water over the fire. As the boiling proceeds, keep mashing the strawberries with a wooden spatula until they are all bruised to a pulp. Then put them into a preserving pan, and to every pound add three quarters of a pound of sugar clarified in half a pint of water. Boil the whole until of due consistence, which will occupy more than half an hour; keeping the jam in constant agitation, lest the bottom should burn. When done enough, take it off the fire and put it into pots.

APPLE JAM.

The apples, which should be ripe, and of the best eating sort, being pared and quartered as for making apple jelly, are put into a pan with just water to cover them, and boiled until they can be reduced to a mush. Then for each pound of the pared apples, a pound of sifted sugar is added, being sprinkled over the boiling mixture. Agitate it well, until reduced to a jam. Then put it into pots.

The above is the most simple way of making it; but to have it of the best possible clearness, make a thick syrup with three pounds of sugar to each pint of water, and clarify it with an egg, as before directed. Then add one pint of this syrup for every three pounds of apples, and boil the jam to a proper thickness.

CRAB APPLE JAM.

Pare the crab apples when quite ripe. Put them into a stone jar, cover it well, and put it in a pan of boiling water for an hour and a half. Then prepare the syrup with two pounds of sugar in half a pint of water, for every pound of the apples. Clarify the syrup. Then put the apples into it, and boil the whole to a jam.

[*The Magazine of Domestic Economy.*

TO WELD TORTOISE SHELL.

Provide a pair of pincers the tongs of which will reach four inches beyond the rivet. Now file the tortoise shell clear to a tap joint, carefully observing that there be no grease about it. Wet the joint well with water; apply the pincers hot, following them with water, and the shell will be found to be joined, as if it were originally the same piece.

GARDENER'S CALENDAR FOR OCTOBER.

VEGETABLE GARDEN.

Sow Cabbages, Lettuce, Carrots, Beets, Turnips, Radishes, Spinach, Salsafy, Parsnips, Ruta Baga. Transplant Cabbages, Cauliflowers, Brocoli, Onions, Lettuce, Leeks and Endive.

Remarks.—If any of the crops recommended above have not been sown, they should not be neglected longer. Most of them may be yet sown with considerable advantage. The Artichokes should in this month be attended to, the suckers removed and manure given. Strawberries should be set out in this month; they will bear in the ensuing Spring.